THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Sales of 125,000 tons of Bessemer pig iron for delivery largely in the second quarter of the year are the feature of the week. The bulk of this iron was taken by the United States Steel Corporation at $15.75 at Valley furnace, or $16.50, Pittsburg. Other steel makers were also in the market, paying in some instances $16 at the furnace, and on smaller lots as high as $16.25 has been paid. The United States Steel Corporation took all the iron offered it by the associated Bessemer furnaces for the second quarter and other purchases were made from outside interests. The situation in respect to this metal is thus very firm, with every indication of higher prices. The cutting off of production due to the coke shortage has compelled importations, and these are expected to increase in the next few months. A large amount of German Bessemer iron has been sold for this country and among recent sales in England was one of 7,000 tons of West Coast Bessemer for delivery in the United States. A recent round sale of German spiegeleisen for export to the United States indicates that our steel makers have not been able to supply their wants from such of their furnaces as ordinarily run on spiegel. The import movement in pig iron is apparent in the November statistics of the Treasury Department, which reported 13,953 tons brought in in that month, against 2,337 tons in November, 1900. The importation of steel is also expected to grow steadily in the coming months. Independent sheet, wire and tube mills will be compelled to seek foreign steel in view of the announced inability of steel corporation plants to furnish steel in the next six months except to customers having long-time contracts. It is understood that the small importation of German steel for Central Western plants a few weeks ago will be followed by the bringing in of large lots from the same source. Apart from the sales of Bessemer iron noted above the important development of the week is the improved movement of coke to the furnaces. Pig iron output is now larger than for several weeks and the railroads promise further gradual improvement. This should check the tendency toward advances which if they come will be against the judgment of both buyers and sellers. In foundry iron the market is steady, with continued buying for the second half of the year and indications that consumers have yet to contract for considerable metal to take care of their probable requirements in the first half. In finished material the continuing strong demand for structural steel is a factor on which all reports lay stress. At Chicago building contracts involving 18,000 tons of steel were let in the week, and in the East the indications of spring business in construction are plentiful. The Pittsburg mills with their accumulation of rolled steel that the railroads are still unable to move are booking a greater tonnage each week than they ship. Plate manufacturers reaffirmed prices last week with only a change or two in extras for cutting special shapes. There was no serious thought of an advance. Bar manufacturers meet next week and there is a proposal from one quarter for an advance of $1 a ton, but with little probability that this will carry. Yet unquestionably bar business has been unusually heavy for January, and bar iron manufacturers start the year with an increased labor cost. Sheets and wrought pipe are quiet, but without perceptible weakening in prices, beyond a shading of the discount on galvanized sheets. Wire and wire nail manufacturers got together at Pittsburg Tuesday and established an agreement similar to those on plates, bars and structural steel. Wire nails are to sell at $2.05 per keg in large lots and plain wire at $1.95 to jobbers in carload lots. The announcement of Lake Superior ore prices is still delayed pending the effort to secure an advance in the price of Mesabi ores and on old-range non-Bessemers. The outcome is problematical. Meantime all ores are withdrawn from the market. The Mexican rail order which went abroad is now said to have been for 105,000 tons, instead of 300,000. Foreign iron market reports note with satisfaction the retirement of American rail mills from competition for export orders. In Germany conditions seem somewhat improved, with opinion leaning to the view that the bottom has been touched.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Jan. 15.

The feature of the market the past week has been the heavy buying of Bessemer iron by the United States Steel Corporation and other interests amounting to about 125,000 tons for delivery through the second quarter. The Bessemer Pig Iron Association disposed of the entire offerings of its furnaces to this corporation for delivery up to July 1, the tonnage amounting to 75,000 tons, while purchases from outside furnaces makes the total tonnage contracted for about 100,000 tons. In addition other interests purchased Bessemer iron in lots ranging from 500 tons to 5,000 tons, the total aggregating 25,000 tons. The iron purchased by the United States Steel Corporation was on a basis of $15.75 at the furnace or $16.50 Pittsburg. Small lots for prompt delivery, however, were placed at prices ranging from $16.75 to $17, Pittsburg. This heavy buying of Bessemer iron extending throughout the first half of the year places the pig iron situation on a very firm basis and its effects will be far reaching in further strengthening the prices of finished material. In buying so far in the future the United States Steel Corporation has again deviated from its outlined policy to purchase only from month to month and this was done only on account of the evident scarcity of iron. The tonnage of Bessemer iron that still remains unplaced with outside furnaces is comparatively small and there is every indication of a scarcity of this product and still higher prices within the next three or four months.

Coke shipments during the past ten days have been much better than at any time for three months and as a result nearly all the furnaces not only in the two Valleys but in this district are in operation at the present time. While the coke supply at none of the furnaces is large, they are receiving coke in sufficient quantities to keep in constant operation. The railroads have promised the furnacemen that shipments

will grow better daily and that they will again be in position to accumulate good stocks in a short time. This means much not only to the furnacemen, but to the steel producers and consumers of pig iron generally, who have feared for some time that a pig iron famine was imminent owing to the poor operation of the furnaces.

In finished lines the market continues to show great strength especially in rails and structural material. That the rail mills of the country are practically filled up throughout the next year is indicated by their refusal to bid on the Mexican rail order amounting to 105,000 tons, instead of 300,000 tons, as has been previously stated. Up to the present time only 60,000 tons of this order have been placed, English mills having taken this amount. In structural material all the mills are filled up to the middle of May and additional contracts closed during the week for 15,000 tons for building projects throughout the country further strengthens the market. The report that the companies of the United States Steel Corporation have been awarded the contract for the construction of the Pennsylvania railroad tunnel to New York is untrue. As yet plans have not been perfected showing the tonnage of steel required. There is little doubt, however, owing to the immensity of the work that the structural mills of the United States Steel Corporation will be called upon to roll the material and the American Bridge Co. will do the work of erection.

The wire rod market has again advanced during the week, one sale of 1,000 tons having been reported at $35 per ton. The available supply of rods for prompt shipment is very small and owing to the eagerness of many wire producers the price will no doubt go still higher. A number of independent mills rolling their own rods have been heavy buyers of rods during the past week, owing to the scarcity of billets. As yet none of these mills have been compelled to shut down, but the situation is very critical and unless a plentiful supply of rods can be secured by some of them within the next ten days their supply of raw material will be exhausted and the shutting down of their plants will be inevitable.

At the meeting of the plate manufacturers held in New York last week no change in prices outside of those for circles was made. The report that some interests favored an advance was wholly untrue as admittedly conditions do not warrant an advance at this time.

Pig Iron.—Heavy buying of Bessemer iron has characterized the pig iron market the past week and the entire offerings of the furnaces of the Bessemer association for the first half of the year have been taken by the United States Steel Corporation. The total sales of Bessemer in the week amount to about 125,000 tons and the furnaces outside of the association are also pretty well filled up through the first half of the year. While this iron was sold to the United States Steel Corporation at $16.50, Pittsburg, small sales were made as high as $17 per ton. The buying of Bessemer iron since the first of the year has veen very heavy, amounting to about 300,000 tons. Both foundry and forge irons are ruling very firm. Small sales of No. 2 foundry for prompt shipment were made during the past few days at $17 per ton while one contract for 1,000 tons for delivery up to August was placed at $16.25 per ton. Basic iron is very scarce and is being quoted at $16 at the furnace. Forge iron is also exceedingly scarce for delivery through the first quarter and is held at $16.25 per ton, Pittsburg. All the Southern producers of foundry iron have agreed to hold No. 2 at $12 per ton, Birmingham, although this price was established some time ago by some of the large Southern producers. Practically no Southern iron is being sold in this market as the difference in price between Northern and Southern iron is not great enough to warrant the purchase of the Southern product. We revise quotations as follows:

Bessemer, Valley	$15 75 to 16 25
Bessemer, Pittsburg	16 50 to 17 00
No. 1 Foundry	17 00 to 17 25
No. 2 Foundry	16 25 to 16 75
No. 3 Foundry	15 75 to 16 25
Gray Forge, Pittsburg	16 00 to 16 50
Chilled Basic, Valley	15 75 to 16 00
Chilled Basic, Pittsburg	16 50 to 16 75

Steel.—Owing to the scarcity of billets a number of manufacturers of rods have been compelled to shut down their rod mills and to invade the open market to secure rods to operate their wire mills. During the past two weeks heavy sales of Bessemer rods have been made and prices as a result are steadily advancing. Today one sale of 1,000 tons was reported at $35 per ton. Bessemer billets continue scarce except in small lots which are selling at $27.50 to $28 per ton. At present the leading producer is not making very heavy shipments on billet contracts to the outside trade, owing to the big demands of the finishing mills of the corporation. That the billet situation is growing more critical daily is already apparent to independent manufacturers and a number of mills are already considering the installation of open-hearth steel plants.

Ferro-Manganese.—Domestic manganese, 80 per cent, continues to be held at $52.50 per ton, delivered at buyer's mill. Some foreign manganese continues to be sold at $50 per ton and a few sales have been reported at $49.

Spelter.—There has been no change in the spelter market during the past week and prime Western grades continue to be quoted at 4.25c to 4.30c, Pittsburg.

Muck Bar.—The muck iron market has advanced sharply during the past few days owing to the rising forge iron market and also to the increased cost of puddling. We note the sale of 3,000 tons of prime muck at $30.25 per ton.

Skelp.—Heavy buying of skelp both iron and steel for the first half of the year has been reported. Grooved and sheared iron is held at 1.80c to 1.85c, while steel is held at 1.75c.

Rails and Track Material.—That the rail mills of the country are practically filled up throughout the year was shown by their refusal to bid on the order for Mexican rails amounting to 105,000 tons. Only 60,000 tons of this order have been placed up to the present time, English mills having promised satisfactory deliveries. Quotations remain unchanged as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $42; 12 pounds, $38; 16 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $32. Track material: Spikes, 1.95c to 2c; track bolts, square heads, 2.40c; hexagon heads, 2.55c; fish plates, 1.50c to 1.60c.

Plates.—At a meeting of the plate manufacturers held last week at New York prices were reaffirmed. No suggestion was even offered for an advance, despite reports to the contrary. For shearing to circles an advance of 1/10 cent was made, the quotation being 1.80c instead of 1.70c as heretofore. We make the following quotations: Tank plate, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8 $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

Pipes and Tubes.—A fair amount of business is being placed in all kinds of merchant pipe by jobbers desiring to replenish their stocks. Concessions ranging from 3 to 5 per cent from the prevailing quotations are being made by some of the independent mills. Discounts to consumers in carload lots, Pittsburg, are as follows:

MERCHANT PIPE.

	Blk. Per cent.	Galvd. Per cent.
⅛ to ⅜ and 11 to 12 inches	61	48
½ to 10 inches	68½	56

BOILER TUBES.

Steel.

	Per cent.
1 to 1¼ inches	47½
2¼ to 5 inches	65½
1¾ to 2¼ and 6 to 13 inches	60

Iron.

	Per cent.
1 to 1¼ and 2½ inches	43½
1¾ to 2¼ inches	43
2¾ to 13 inches	53

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¼ inches	65

Bars.—Owing to the recent advances in the wages of puddlers and finishers and the advances in the price of forge iron, the leading bar iron interest is in favor of making an advance of $2 per ton on bar iron. It is altogether probable that this

matter will be considered within the next few days and an advance will no doubt follow. Heavy buying of steel bars continues and the bar mills are comfortably fixed so far as tonnage is concerned throughout the entire first half of the year. We make the following quotations: Common iron bars, 1.50c, Pittsburg for Western delivery and 1.55c, Pittsburg, for Eastern delivery; refined iron bars, 1.75c and upwards; Bessemer steel bars, 1.50c; open-hearth, 1.60c; plow beams and cultivator beams, 1.50c, net; channels, angles, zees and tees, Bessemer under three inches, 1.60c; over 3 inches, 1.70c. Hoops and bands are quoted at 1.90c, full extras.

SHEETS.—A fair demand continues for black sheets and while the independent manufacturers are meeting the prices of the American Sheet Steel Co. no lower prices are being made. On galvanized slight concessions have been reported, 7½ off having been done by one outside mill. We make the following quotations: Nos. 10 and 12, 2.40c to 2.50c; 14 and 15, 2.50c to 2.60c; 16, 2.60c; 18 and 20, 2.70c to 2.80c; 22 and 24, 2.80c to 2.90c; 26, 2.90c to 3c; 27, 3c to 3.10c; 28, 3.10c to 3.20c; 29, 3.25c to 3.35c; 30, 3.35c to 3.45c. Galvanized sheets are quoted at 70 and 5 and 75 off in carload lots; less than carload lots, 70 and 70 and 5 off.

STRUCTURAL MATERIAL.—Contracts for fully 15,000 tons of structural material were placed with local mills this week. Contracts now on the books of the structural mills will keep them in full operation for the next four months. The contract for the Pennsylvania railroad tunnel has not yet been placed despite reports to the contrary. It is probable that it will be awarded to the United States Steel Corporation, however, owing to the large amount of material required. Prices are firm but unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—At a meeting of representatives of the independent wire interests of the country and the American Steel and Wire Co. held here Tuesday, Jan. 14, a new price list was established and an agreement reached to hold prices on a basis similar to the plate, bar and structural steel agreements. The meeting was in session all day and upon its conclusion it was announced that prices had been established on a basis about equal to the ruling market. Wire nails which have been selling on a basis of $2.05 to $2.10 per keg in carload lots were fixed at $2.05 per keg to large jobbers, $2.10 per keg to carload buyers and $2.20 on less than carload lots. Plain wire to jobbers in carload lots was fixed at $1.95 and at $2 in less than carload lots, and at $2.05 to retailers, base, with the usual advances for sizes and galvanizing. There was no change in barb wire. The following quotations are continued: Painted barb wire, $2.60 in carload lots to jobbers, and $2.70 to retailers; galvanized barb wire, $2.85 to $2.90 in carload lots to jobbers, and $3 to retailers. Cut nails are sold at $2.05, Pittsburg, in carload lots, and $2.10 to $2.15 in less than carload lots, 2 per cent off in 10 days.

MERCHANT STEEL.—Demand for shafting is reported strong and prices are firm at 55 and 60 off. The crucible steel market is also reported in an exceedingly strong condition and the Crucible Steel Co. of America is reported several months behind on its deliveries. Our quotations are as follows: Cotton ties, in lots of 10,000 bundles and over, 80 cents per bundle; less than 10,000 bundles and over 2,000 bundles, 83 cents per bundle; for 2,000 bundles and less, 85 cents per bundle. All prices are quoted at mill, Pittsburg, full freight added to place of delivery. These prices are for delivery up to April 1, for preferred delivery ½ cent extra per month is charged. Turned, cold rolled and ground shafting, 60 per cent off for car lots and 55 per cent off for less than car lots; tire steel in carload lots and over, 1.60c; less than carload lots, 1.75c to 1.80c. Toe calk is sold at 1.70c, in large lots, and in small lots as high as 1.85c. Tool steel is held at 7c and upwards, according to quality.

OLD MATERIAL.—A good demand continues for heavy melting stock for open-hearth purposes and the price of this material has been slightly advanced during the week. The strength of the pig iron market is being reflected in old material and slight advances are anticipated all along the line. We revise quotations, gross tons, as follows: Heavy melting stock, $17.25 to $17.50; low phosphorus melting stock, $18.25 to $18.50; steel rails, $17 to $17.25; busheling scrap, $13.50 to $14; No. 1 wrought, $17.25 to $17.50; iron rails, $22 to $23; cast borings, $8.25 to $8.50; cast scrap, $14 to $14.25.

COKE.—According to the Connellsville *Courier* the production of the Connellsville region for the week ending Saturday, Jan. 4, amounted to 208,260 tons, an increase over the previous week of 38,019 tons. Shipments for the week amounted to 9,940 cars. Connellsville furnace coke for prompt delivery continues in good demand and premiums of 50 and 75 cents per ton are being paid. For future delivery furnace coke is held at $2.25 and foundry at $2.75. Outside coke is held at about 25 cents per ton less.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
534 MONADNOCK BLOCK, Jan. 14.

There is little improvement in the situation here, so far as the coke supply is concerned. Furnace operators are making strenuous efforts to get together a sufficient quantity of fuel to put some of the idle furnaces in blast, but are meeting with small success. Such as are successful have to pay an exorbitant price for the coke, which means operating the furnace at a loss. The Excelsior furnace at Ishpeming, Mich., which makes Lake Superior charcoal iron, was blown in last week, but this is offset by the report that a local furnace which was put in operation a couple of weeks ago, after being idle for a time, will probably go out of blast again in a few days. The past week has been an active one in all lines of raw and finished iron and steel. In pig iron, the buying has been almost entirely for delivery in the last half of the year, though one Southern furnace reports having sold 10,000 tons of No. 2 soft for delivery in the next two months. The transactions include many large orders, one of them being for 4,000 tons which was placed by a local car builder, and an inquiry for 8,000 tons by an implement manufacturer. An advance of 50 cents a ton was made last week by those Southern furnaces which had maintained prices at the old level, bringing the minimum price of Southern No. 2 foundry to $15.65.

Contracts have been let to Central Western mills for the structural steel required in the First National Bank building and the Young building, to be erected in this city, amounting in all to about 18,000 tons. Buying in bar iron has been very active, nearly all the independent mills being sold up for three and four months. Both local sellers of track supplies are out of the market for at least three months. In all other lines of finished material the same activity is reported, and if the car and fuel shortage was removed, both production and consumption in this territory would be marvelously increased.

PIG IRON.—Sales during the past week have been active, and include many large orders. Nearly all the transactions call for delivery in the last half of the year. Only one concern represented in this city is in position to furnish iron for prompt shipment ,and this is due to the fact that it controls its own fuel supply. This firm reports that it sold in one day last week 10,000 tons of No. 2 soft for delivery within the next two months. The inquiry for delivery in the last six months is very large, including one from a local implement concern for 8,000 tons. An advance of 50 cents a ton was made last week by those southern furnaces which did not increase prices at the time others did two weeks ago, making the minimum price of Southern No. 2 foundry $15.65. There is a good demand from malleable foundries for Lake Superior charcoal iron, which is being substituted for coke iron by many foundries. Though no change has been formally announced, we advance the maximum price of Northern irons 50 cents a ton, as it is impossible, owing to the peculiar situation existing here, to purchase iron at the prices quoted. The Excelsior furnace at Ishpeming, Mich., which manufactures Lake Superior charcoal iron, was blown in last week. This leaves 11 furnaces still idle for want of fuel. Our quotations follow:

Lake Sup. Charcoal	$19 25 to $19 75	Southern No. 1 Soft	$16 15 to 16 40
Local Coke Fdy. No. 1	16 00 to 16 10	Southern No. 2 Soft	15 55 to 15 90
Local Coke Fdy. No. 2	15 50 to 16 00	Southern Gray Forge	14 65 to 14 90
Local Coke Fdy. No. 3	15 00 to 15 50	Southern Silveries	16 65 to 17 65
Local Scotch Fdy. No. 1	16 00 to 16 50	Jackson Co. Silveries	17 00 to 17 50
Local Scotch Fdy. No. 2	15 50 to 16 00	Ohio Strong Softeners	17 50 to 18 00
Southern Coke No. 1	16 40 to 16 65	Alabama Car Wheel	20 50 to 21 00
Southern Coke No. 2	15 65 to 15 90	Malleable Bessemer	16 50 to 17 00
Southern Coke No. 3	15 15 to 15 40	Coke Bessemer	18 00 to 18 50
Southern Coke No. 4	14 65 to $14 90		

BARS.—There is an exceedingly strong demand for both

iron and steel from all consumers. Specifications against contracts are very heavy and new business is in good proportions. Some of the smaller independent mills are out of the market for three and four months, and the larger mills are rapidly selling their capacity for the first half of the year. A good share of the business comes from car builders, wagon and implement manufacturers, and the material is so urgently needed by these manufacturers that premiums are offered daily to get desired shipments. The market is very firm. We quote iron and steel, 1.65c. Chicago; out of store, 1.90c to 2c.

SHEETS.—Mills report a good volume of business, contracts being placed for delivery many months ahead. The shipment of sheets into this territory is seriously hampered by the lack of cars, compelling many consumers to go to jobbers for pressing needs. We quote No. 27 black from dealers, 3.50c, and galvanized 70 per cent. to 70 and 5 per cent.

BILLETS.—A few sales in small lots have been made in the past week. We quote Bessemer billets, $31 to $33, and open hearth, $33 to $35.

STRUCTURAL STEEL.—Contracts have been let to Pittsburg mills for the structural steel which will be required in the erection of the First National Bank and Young buildings in this city, which call for about 18,000 tons of material. The general business has been excellent, and the aggregate tonnage of smaller orders is up to that of previous weeks. Mills are still hampered by the car shortage, and heavy sections of beams cannot be secured within four to six weeks; light sections and angles in three months; universal plates, six to eight weeks; and sheared plates in four weeks. We quote mill shipments, carload lots, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 6x6 and under, 1.75c; over 6x6, 1.85c; plates, 1.75c, base; tees, 1.80c; zees, 1.75c; small lots from store, ½c to ¾c higher; beams and channels from store, ½c to ¾c per pound higher.

RAILS AND TRACK SUPPLIES.—Continued inquiries for standard rails are reported from steam and electric railroads, but since most of these are for spring delivery, developments stop at this stage. A few orders have been booked for delivery late in the year, but the tonnage is small. There is a good demand for light rails; also track supplies; though both the local manufacturers are out of the market on the latter for the next three months. We quote as follows: Standard rails, $28; light sections, $34 to $36, according to size; out of store, $40 to $44; splice bars, 1.70c to 1.80c; spikes, 1.95c to 2.05c; track bolts and hexagon nuts, 2.80c to 2.90c, out of store, 2.90c to 3c; square nuts, base 2.65c to 2.75c; out of store, 2.75c to 2.85c.

MERCHANT STEEL.—Mills farther East have closed a number of contracts in the past week, generally for delivery after April 1. The demand for material comes from all sources, many concerns exceeding their contracts. We quote mill shipments, Chicago delivery, as follows: Smooth finished tire steel, 1.85c to 2c; open-hearth spring steel, 2.25c to 2.50c; toe calk, 2.40c to 2.60c; sleigh shoe, 1.65c to 1.80c; cutter shoe, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 per cent to 10 per cent higher.

PLATES.—The local interest reports that the demand is of fair proportions, and that it can make delivery in four to six weeks. Our quotations follow: Tank steel, base, ¼-inch, 1.75c to 1.85c; flange steel, 1.90c to 2c; marine steel, 1.95c to 2.10c; firebox steel, ordinary, 2c to 2.10c; special, 2.25c and upwards. Jobbers are selling from store according to size, as follows: Tank steel, 1.90c to 2c; flange steel, 2.10c to 2.25c; marine steel, 2.40c to 2.50c; firebox steel, ordinary, 2.40c to 2.50c; special, 2.50c and upwards.

CAST IRON PIPE.—Though the orders booked in the past week are not very numerous, nor of large proportions, there are excellent inquiries, some of them calling for large tonnage. As a result of the firmness in the pig iron market, the price of cast iron pipe will be maintained up to scheduled quotations. We quote as follows: 4-inch water pipe, $29; carload lots, f. o. b. Chicago; 6-inch water pipe, $28; 8-inch and larger sizes, $27; gas pipe, $1 per ton higher than above prices.

MERCHANT PIPE.—Mills are booking little business, as this is the dull season. There is a good demand from jobbers' stocks for boiler tubes. We quote as follows:

MERCHANT PIPE, RANDOM LENGTHS.

	Black Per cent.	Galv. Per cent.
⅛ to ⅜ and 11 to 12 in.	59.5	46.5
½ to 10 inches	67	54.5

BOILER TUBES.

	Steel Per cent.	Iron Per Cent.
1 to 1⅜ in.	40	35
1¾ to 2½ in.	47½	37½
2¾ to 5 in.	57½	47½
6 in. and larger	45	40

WIRE AND WIRE NAILS.—There is a heavy demand for all kinds of wire products, and it is very probable that prices will be advanced within the next few days. Several of the smaller mills have already advanced prices and those of the leading local manufacturer are very firm. The low prices that were prevailing in some Western districts, owing to the freight demoralization, have all been withdrawn and an advance of 15 cents to 25 cents per hundredweight has been made in these districts. Present prices are very firm. We quote nails in small lots to the retail trade, $2.25; painted barb wire, $2.70 to $2.80, and galvanized wire, $3 to $3.10.

COKE.—No improvement has been made in the coke supply since our last report, and both furnaces and foundries are scrambling for all that is in sight, and paying good-sized premiums. One local dealer, who succeeded in getting a few cars together for immediate shipment, received nearly fifty orders for the coke, none offering less than $6 a ton, and some as high as $6.50. Contracts for future delivery are being taken at $5 to $5.25.

OLD MATERIAL.—All the mills are stocked up with material, and are only buying special grades for which they can always find use. Owing to the scarcity of pig iron, foundries are heavy buyers. All dealers are optimistic and some are expecting a heavy buying movement in the near future. We quote as follows:

The following are net selling prices per ton:

Old iron rails	$21 00 to $21 50	Relaying rails	27 00 to 28 00
Old steel rails, 5 ft. and up	21 00 to 21 50	Old wheels	$16 50 to $17 00
Old steel rails, mixed	14 00 to 15 00	Heavy melting steel	14 00 to 14 50
		Mixed country steel	10 50 to 11 00

The following are selling prices per net ton:

No. 1 R. R. wrought	$15 00 to $15 50	Steel Axles	$18 50 to $19 00
No. 2 R. R. wrought	13 25 to 13 75	Cast borings	5 25 to 5 75
Dealers' forge	13 00 to 13 50	Wrought turnings	10 00 to 10 50
No. 1 bushelling	11 00 to 11 50	Iron axle turnings	12 00 to 12 50
No. 1 R. R. & mach. cst.	11 75 to 12 25	Steel axle turnings	11 00 to 11 50
Railway malleable	12 00 to 12 50	Stove plates	8 50 to 9 00
Country malleable	11 50 to 12 00	Old iron splice bars	16 50 to 17 00
Iron axles	21 00 to 21 50		

The ordinance limiting the height of buildings in Chicago to 132 feet was practically repealed by the city council last week, when it issued permits for the erection of buildings several stories higher than the limit. At this meeting, permits were granted to the First National Bank for the erection of a sixteen-story building; to the Tribune Co. for adding four stories to its office building now in course of construction, to Otto Young, for a sixteen-story building; to the Hartford Deposit Co., for a fourteen-story annex to the Hartford building; to Hibbard Spencer & Bartlett, for a building of mill construction, eight and one-half feet higher than the prescribed limit of 100 feet for that class of structures.

CLEVELAND

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Jan. 15.

The question of ore prices for 1902 is still unsettled. After some considerable selling of Mesabi ores and of old-range non-Bessemers all ores were withdrawn from the market pending an effort to reach an agreement on non-Bessemer ores and all Mesabi products. Whether this can be accomplished is not yet determined. The absence of some producers from preliminary conferences has postponed the final decision, but it is probable that a definite outcome is now a matter of another week. The Mesabi problem involves several factors, the chief of which is the very large preliminary estimates of producers as to their outputs for next year. While the Mesabi range contributed about 9,000,000 tons out of something over 20,000,000 tons in 1901, the plans for next year will yield a total—providing the ore can be marketed—of 14,000,000 to 16,000,000 tons. Several mines are scheduled for 1,500,000-ton outputs. It is quite plain that nothing like 15,000,000 tons of Mesabi ores can be consumed next year.

The question is, will all producers submit to a scaling down of their estimates? This is the only practicable route to an agreement on prices that shall give, say, $3.25 a ton for ores that last year brought in the neighborhood of $3. One great difficulty is that some mines have sold heavily for 1902. The same difficulty is encountered in non-Bessemer ores from old ranges, on which there is a proposal to raise the basis from $3 for standard ores as in 1901, to about $3.25. On the better Mesabi ores it is understood that the United States Steel Corporation would be willing to see a substantial lessening of the deferential that now exists against the ores of this range. As high as $3.50, or 75 cents below the old-range Bessemer base, has been discussed for some of these ores.

PIG IRON.—Sales of Bessemer iron to the United States Steel Corporation for delivery in March, April, May and June have been the feature of the past week. It is estimated that 100,000 tons were distributed among the various Valley furnaces, deliveries chiefly in the second quarter, the price being $15.75 at the furnace. At the same time sales have been made to other steel makers at $16 a ton at the furnace and sales in small lots have brought as high as $16.25 in the Valley. The situation is thus very firm and the indications are that such lots of Bessemer as can be picked up in the next five months will bring considerably higher prices. The conditions in foundry iron are strong with unchanged prices. Buyers are still taking on contracts for the second half and are finding comparatively little Northern iron available for the first half, though it would seem that there are a good many foundries whose wants for that period are not yet provided for. The outlook for foundry work is excellent. Locally the question of wages is one that is likely to come up for settlement in the near future. Forge iron is very scarce and in some instances has sold for early delivery as high as No. 2 foundry. We quote as follows f. o. b. Cleveland:

Bessemer	$16 50 to $17 00	Scotch No. 1	$16 50 to $17 00
No. 1 Strong F'dry	16 50 to 17 00	Scotch No. 2	16 25 to 16 75
No. 2 Strong F'dry	16 25 to 16 75	Gray forge, Valley	15 50 to 15 75
No. 3 Foundry	15 75 to 16 00	LakeSuperior charc'l	18 00 to 19 00

FINISHED MATERIAL.—Demand has kept up evenly in most lines, the largest business being in bars and structural material, with plates fairly active and sheets and wrought pipe less so, in view of the season. Late January and early February usually bring out plans for spring work, and it is known that architects have some matters in hand that will soon come to the attention of steel men. Concerns having to do with iron and steel construction have made good-sized contracts for structural steel in the past month or two, indicating expectations of a busy season. The plate market has been steady and rather quiet. The principal change in the price schedule at the New York meeting was in circles, which now carry a 2/10 extra instead of being put with sketch plates at 1/10 extra as heretofore. The situation on bars may be clearer after the meeting of manufacturers to be held next week. It is understood that one interest favors an advance of $1 a ton or back to the 1.55c Pittsburg basis of two months ago. Other makers are in favor of holding prices where they are. There has been a good business in the past month, yet with it some anxiety on the part of certain producers to get a large tonnage on their books early in the year. Under these conditions the chances of a general advance are not good, though individual producers may accumulate tonnage enough to lead them to advance quotations on certain deliveries. We continue to quote 1.58½c Cleveland on mill shipments of iron and steel bars. Large buyers out of stock pay 1.70c, Cleveland, others 1.75c, Cleveland. On beams and channels we quote 1.70c, Cleveland, and from ½c to ¾c additional is charged on small orders cut to length out of stock. In sheets there is a sorting up of ware house stocks now that deliveries from mills are improved. Independent mills are reported to be making slight concessions on galvanized sheets, and as yet are not prevented by the scarcity of steel from taking their share of the business in black sheets. We quote mill shipments as follows, f. o. b. Cleveland: No. 24, 2.90 to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c, with usual extras for less than carload lots, etc. Round-lot quotations from store are as follows: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55c to 2.70c; No. 16, 2.95c to 3.10c; No. 18, 3c to 3.15c; No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 25-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c. The above are for one pass through cold rolls. For full cold rolled the extra is .10c. Galvanized sheets are quoted 70 to 70 and 5 off list.

OLD MATERIAL.—The demand for scrap holds up and a brisk business is reported by the local trade. The general activity in iron and the consequent strengthening of prices has led to a firmer tone in old material. The actual figures on current sales, however, closely approximate the quotations published a week ago. These are as follows, all in gross tons:

Old steel rails, rolling mill lengths	$17 00 to 18 00
Old steel rails, short lengths	15 75 to 16 50
Iron rails	21 00 to 22 00
No. 1. railroad wrought	16 50 to 17 50
Mill scrap	14 50 to 15 00
No. 1. machine scrap	13 75 to 14 25
Machine shop turnings	12 50 to 13 00
Cast borings	6 50 to 7 00
Grate bars	8 50 to 9 00
Sheet iron	9 00 to 10 00
Stove plate	10 00 to 10 50
Car wheels	15 50 to 16 50

CINCINNATI.

Jan. 11.

The situation is substantially unchanged. Since the advance by all the Southern furnaces of 50 cents a ton on pig iron the price has remained firm and buying has gone on undiminished. Probably the only noteworthy difference between the condition of the iron trade this week and during the past few weeks is some easing up in the car situation. The furnaces are getting coke a little more readily and those that have been banked on account of inability to get coke and the trouble in keeping labor have started up again.

PIG IRON.—The pig iron situation remains firm. There is, according to the iron handlers, no feature of relief save that the furnaces have been able to get coke more freely, though not yet freely enough. Southern furnaces are starting up again where they have been closed down, and while the price of pig iron has demonstrated that it can hold the recent advance it is not thought that there will be any further advance right away. It is expected that producing capacity will begin to get back to where it was before the coke scarcity caused so many furnaces to bank their fires. With furnaces generally starting in again it is believed there will be no reason for a much higher figure in pig iron.

Buying has not been in any very large amounts. Orders for 1,000 and 1,500 ton lots have predominated. Local selling firms have received orders in a day aggregating 9,000 and 10,000 tons and it has all run up into good figures. These orders for delivery during the first half, however, have the appearance of being to fill in, and few of them are large initial orders. Prices at Cincinnati remain practically unchanged as follows:

Southern Fdy. No. 1	$15 25 to $15 50	Gray Forge	$13 75 to $14 00
" " 2	14 75 to 15 00	Northern Fdy. No. 1	17 10 to 17 35
" " 3	14 25 to 14 50	" " 2	16 60 to 16 85
" " 4	13 75 to 14 00	Southern C.W. iron	18 75 to 19 25
So. Fdy No 1 soft	15 25 to 15 50	Malleable coke iron	16 60 to 16 85
So Fdy. No. 2 soft	14 75 to 15 00		

FINISHED MATERIAL.—The market for finished material has stiffened up considerably during the past week. It has been firm all along, but prices have not been advanced save in the iron stores, where premiums have been asked and had. At this writing, however, advices have been received by local branches of large bar iron and steel interests to advance the prices on these materials. The orders were to sell bar iron on the basis of 1.70c and half extras at Cincinnati, and bar steel at 1.72c. This is an advance in the case of bar iron of 8 cents and in the case of steel of 10 cents. The advance is considered rather arbitrary. While it was not entirely unlooked for, it is larger than consumers would like. The demand for all classes of finished material is good and manufacturers have been buying without a let-up for the best delivery that can be promised by the mills. Prices on other mill products remain the same: angles, 2c; plates, 1.85c; sheets, No. 28, 3.35c to 3.40c; No. 12 blue annealed, 2.35c.

OLD MATERIAL.—Scrap iron and steel have kept along in an even course. There has been no change since last quotation and transactions have been in moderate amounts. The demand remains good. Prices at Cincinnati are as follows:

Old No.1 Wrought Railroad, net tons	$ 15 50 to 16 00
Cast Machine and Foundry, net tons	12 50 to 12 75
Old Iron Rails, gross tons	21 25 to 21 50
Old Steel Rails, gross tons	18 00 to 18 25
Old Short Lengths, gross tons	15 00 to 15 25
Old Iron Axles, gross tons	21 00 to 21 50
Old Iron Car Wheels, gross tons	16 00 to 16 25
Stove Plates, gross tons	9 75 to 10 00
Wrought Turnings, net tons	11 50 to 11 75
Cast Borings, net tons	5 50 to 6 00

[Additional Markets on page 26.]

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

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FOUNDRY DEVELOPMENT IN THE PAST TWO YEARS.

On several occasions we have made use of the statistics of pig iron production, other than steel-making pig, to call attention to the expansion of the foundry industry in the United States in the past few years. While the output of foundry iron and that of forge iron are not separated in the official statistics it is possible so to gauge the puddling industry as to determine whether the increase in the total of foundry and forge irons is due chiefly to greater activity among foundries. In the past two years the foundries have spoken for themselves. The enlargement of existing plants and the building of new ones have been constant features of the industrial news printed in our columns from week to week. The increased home demand for machinery of all descriptions has driven machinery founders in an unheard-of way. The consumption of malleables in agricultural and railroad work has called for the erection of much new plant. Specialty manufacturers have made an unusual call upon the resources of light gray iron plants. And steel foundries, it need scarcely be said, have not known such activity as that of the past two years.

Probably the best statistical evidence of the growing importance of the foundry industry of the United States is given in Penton's Foundry List for 1902, a volume issued at the beginning of the year. The preface states that more than 10,000 letters were written in gathering data, and the result is the most accurate list of the iron, steel and brass foundries of the country that has been published. Briefly summarized the figures show that there are 4,615 iron foundries in the United States, as against 4,145 on Jan. 1, 1900, a gain of 470 in two years. A list of brass foundries shows 875, giving a total of brass and iron foundries in the United States of 5,490. Malleable iron foundries increased in the two years from 95 to 107. Pennsylvania has 16, a gain of 4; Illinois, 18, a gain of 2; Ohio, 12, a gain of 2; New York, 15, as in 1900; Indiana, 7, a gain of 2; Michigan, 6, a gain of 1; Wisconsin, 11, a gain of 2; Connecticut, 10, as in 1900, with the remainder scattered through eight States. In steel foundries the increase is from 51 in 1900 to 72; in stove foundries from 249 to 269.

The foundry industry of Canada is measured for the first time in this directory. There are 501 iron foundries and 26 brass foundries. Of the 501 iron foundries 6 make malleable cast iron, 1 makes steel castings and 28 are stove foundries. Ontario has 312 of the 501, Quebec 109, Nova Scotia 31, British Columbia 13, New Brunswick 20.

The backbone of the foundry industry of the country is in the States of New York, Pennsylvania, Ohio, Illinois, Michigan, Indiana and Wisconsin—all of them States which touch the great lakes. In New York the increase from 1900 to 1902 in the number of iron foundries was from 515 to 521; Pennsylvania, from 646 to 721; Ohio, from 400 to 436; Illinois, from 298 to 333; Michigan, from 230 to 258; Indiana, from 185 to 214; Wisconsin, from 173 to 185. These seven States have a total of 2,678 iron and steel foundries, or 58 per cent of the total for the country. Other strong foundry States are Iowa with 124, Massachusetts with 180 and New Jersey with 155.

Today the foundry industry of the country is prosperous to a marked degree. Labor troubles are relatively few and the indications are for a year of extensive operations in all lines.

AMERICAN SHOP METHODS.

The observations in the United States of an English engineer—or machinist, as he would be called on this side—are reprinted elsewhere in this issue from *Engineering* of London. The writer of the article has recorded his impressions of our more advanced machine tool shops, and the record forms a very interesting communication based as it is on a working acquaintance, a practical knowledge at first hand, which has been the privilege of few writers on this subject. Some of the assertions may be overdrawn or at least suggest a difference in conditions which after all is not so pronounced as one might be led to suppose. The point of view is the determining factor in the estimates, and it is only through an extended experience that the observer can see the industrial situation in proper perspective.

There are shops and shops in England and the United States, and the constant interchange of experience in mechanical matters cannot but have a modifying influence upon methods of production. There is no doubt that American methods of production as well as details of machinery design have had considerable influence upon workshop practice abroad. Some of the earlier machines were in their various parts of very unequal merit, but later developments brought about the heavy box bed and in many other respects the anvil principle is followed very closely here. If there is any more substantial evolution elsewhere along these lines it has not appeared in the photographs and other illustrations of the more recent machine tool practice that we have so far received from England.

It must be admitted that there is a tendency here to use a milling machine for heavier work than it was originally designed to handle economically. The fault must be laid to the very convenient nature of the tool

and its adaptability to all sorts of requirements; hence it is pressed into service for an all-round usefulness. There are milling machines, however, that are well adapted for heavy work and these will rough out stock with steady and substantial cuts.

The writer has had some experience in English shops and is not yet prepared to believe that cast iron in general is so much harder to work than it is here. In both countries there are men who practice a policy that effects a cheapening of the foundry costs at the expense of the machine shop, but it would be unfair to accept these cases as typical. Of course the purpose of the casting will make an important difference in the specifications; as for example the cylinder of a steam engine compared with the flywheel. In any event the metal is so disposed in a well designed machine that the component parts are proportionately able to sustain the working strains. Even if it be admitted for the sake of argument that the cast iron in American tools is very much softer than the material employed for the same service elsewhere, there is the awkward query to meet, How then explain the remarkable productive efficiency of American machine tools? How is it that these delicate and unsubstantial devices are capable of being forced at high speed and long hours by workmen who are proverbially impatient with the faults of mechanism? The critic must have either one or the other horn of the dilemma, as weakness either of material or design is not a characteristic of modern machine tools.

It is true that considerable of our tool steel is imported. Many steel workers prefer a brand of steel with which they have had long experience and there is some annoyance and considerable expense for employe and employer when radical changes are introduced in the supply of tool steel. Prejudice is often as much to blame as ignorance, for the unsatisfactory results when a change of this kind is made, in spite of the fact that tools here have been record-breaking when made of American material and handled by native methods.

It would require altogether too much space for a thorough discussion of the many points suggested by a reading of the article. One or two matters at least are obvious slips of the pen, as when it is asserted that the shaper head is fixed and the work does the traversing—a condition of affairs that is diametrically opposed to the usual construction. May we not hope also that the gloomy anticipations of the future of labor are equally erroneous and that we shall see fewer and fewer of these great struggles for supremacy between workmen and employers? Though the writer of the *Engineering* article worked in American shops he certainly has too slender a basis of facts for so hopeless a view of our labor problem.

A MOVING PLEA FOR THE STEEL INDUSTRY.

Manufacturers whose experience has been in the sale of iron and steel products and not the product of printing presses and paper mills, cut into stock certificate sizes, may have marveled at the amount of publicity recently given to a steel casting plant 200x130 feet, located in an Eastern State. There is nothing remarkable about the size of the plant nor about the castings it produces; steel foundries are no rarity and no mystery. Yet pages of good newspaper space—advertising space—have been taken up with this enterprise, not so much with offers of its products, for these seem to be but incidental, but with offers of the stock of the company. Recently, in order to carry out some improvement plans, a trifling matter of 40,000 out of some 200,000 or 300,000 shares still in the treasury—ample provision against scarcity having been made in the beginning—was offered to the public at $5 a share. The modest sum of $200,000 thus made available ought to give the 200x130-foot foundry a fairly respectable wing. It is interesting to know that the castings from this plant "are steadily and permanently displacing more expensive forms of steel," and more interesting to be told that they "are of strictly pure steel of uniform hardness and softness throughout."

That steel manufacturers who may find their pathway less thorny than heretofore should know to whom thanks are due, we quote from the same advertisement this evidently heartfelt plea for a popular subscription:

> The manufacturing of steel has been up to within a few years a comparatively infant industry. It is in expanding and developing this branch of the Nation's wealth that the greatest successes of the future are to be looked for. Steel today is in such a position that it is right to invite capital toward its advancement. [A fine question of morals here.] It is the mission therefore of everyone interested in the development of this resource to see that the industry is afforded every possible encouragement to put it to the front and let it speak for itself, for if this is done it will raise up its own friends and rally its own supporters.

Will some brother pass the hat?

Obituary.

Moritz Lassig, founder of the Lassig Bridge and Iron Works of Chicago, Ill., died at his home at the latter place on Tuesday, Jan. 7, aged 70 years. Deceased was born in Germany in 1831 and after receiving a thorough technical education at the School of Technology at Chemnitz, came to the United States in 1851 and settled in Chicago. He first became connected with the Boomer & Boyington Co. and later was associated with the American Bridge Co. In 1876 he left the employ of the latter concern and established his own business. The plant was absorbed by the American Bridge Co. upon its formation and Mr. Lassig retired from business after disposing of his interests.

Joseph G. Wainwright, 55 years old, president of the Fayette Mfg. Co., manufacturer of basic fire brick, died at his home in Pittsburg on Sunday, Jan. 12.

H. A. Reyer has severed his connection with the Crucible Steel Co. of America, at Denver, Col., and will take charge of the Denver branch of the Colonial Steel Co., having opened an office at 203 Quincy building, Denver, Col. The Colonial Steel Co. will carry a stock of all kinds of crucible tool steel and drill steel in its Denver warehouse.

The Quincy Engine Works, Quincy, Ill., is removing its office from the Wells building to the works in the northeast part of the city. The company has received a number of orders for large sizes of the Williams vertical compound steam engine.

The Standardizing Bureau of the American Foundrymen's Association announces that hereafter separate bottles of the standardized drillings A, B, C and D, will be sold for $2 each. This is to accommodate those laboratories in which only one or two of the standards are needed. The standardized drillings are now in such demand that it has been found necessary to prepare a fresh stock of samples A, and D, and these are now again ready for distribution.

PHILADELPHIA MARKET.

Jan 14.

While the iron and steel markets have shown a week of comparative quietness, this is more due to the continued scarcity of iron than to any actual disinclination to do business. In short, it is not prices but deliveries which are worrying both makers and consumers. Transportation interests come in for their share of the blame in connection with the shortage of iron, and although the trade looks forward to early relief from this source, it is a question if there is not to be an extended scarcity of coke, which will indefinitely curtail the output of pig iron. Considering the volume of business being transacted, stocks have reached the lowest point on record and the situation daily becomes more serious. The temporary suspension of work is to be noted here and there, and on the whole there is manifested a good deal of uneasiness.

PIG IRON.—It is almost out of the question to obtain reliable figures as to transactions in pig iron, owing to the scarcity of this material, which makes prices according to circumstances in each case the rule of the market. Very few sellers are in a position to offer anything at all for the next three or four months, as they will have their hands full to fill contracts they have made for deliveries during this period. The reduced output blast furnace interests are experiencing makes it plain that many furnaces are badly over-sold and will be unable to meet deliveries promptly. The situation is, to say the least, very embarrassing to both buyer and seller, and many of the latter, who under ordinary conditions would be only too glad to take on new business, are now holding off, fearing that they may not be able to meet their obligations when these become due. On what little iron it is possible to scrape together values would likely range about as follows for Philadelphia and near-by points: No. 1 X foundry, $17.25 to $17.50; No. 2 X foundry, $16.50 to $17; No. 2 plain, $16 to $16.50; standard gray forge, $15.75 to $16; ordinary gray forge, $15; basic (chilled), $15.75 to $16; Bessemer, $16.50 to $17.

FINISHED MATERIAL.—Outside of structural material, fairly good deliveries may be had in all lines. A slight falling off is showing itself in some directions but general prospects are excellent, with every indication that business will be all that is expected of it for the next six months at least. For city and seaboard deliveries quotations are about as follows: Plates, ¼-inch and thicker, 1.75c to 1.80c; bars, iron or steel, 1.62½c to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

Another Pneumatic Tool Combine Proposed.

Following the organization of the Chicago Pneumatic Tool Co. consolidation another combine of pneumatic tool manufacturers is being planned, with the Standard Pneumatic Tool Co., of Chicago, as a nucleus. The proposed name is the Standard Pneumatic Tool Co. and the capital talked of is $2,500,000. The companies for whose plants and business negotiations are under way are the following: The Standard Pneumatic Tool Co. of Chicago, with plants at Aurora, Ill.; International Pneumatic Tool Co., of London, with plants at Chippenham and Wiltshire, Eng.; Philadelphia Pneumatic Tool Co.; Standard Railway Equipment Co. of St. Louis, and the Cleveland Pneumatic Tool Co. It is stated that Charles R. Flint, of New York, is a prime mover in the proposed deal.

New Coal and Coke Supplies of the Steel Corporation.

The H. C. Frick Coke Co. of the United States Steel Corporation is preparing to develop 20,000 acres of coal land in the famous Pocahontas region in West Virginia. The right to lease 30,000 acres of additional property has been reserved, but as yet it has not been selected. The United States Coal & Coke Co. will be organized to operate this property and it is the present intention to erect 3,000 coke ovens in the region to produce furnace coke for the Western plants of the United States Steel Corporation. It is estimated that fully 1,500,000 tons of coke will be produced annually in this region and 1,000,000 tons of coal, all of which will be shipped to the Western plants of the United States Steel Corporation. William Glyde Wilkins, of Pittsburg, will be placed in charge of the development of the region. The coal in this region is seven feet thick and although it must be crushed for coking purposes it produces excellent coke. The National Mining Co., another subsidiary company of the H. C. Frick Coke Co., will provide the coal for the plants of the United States Steel Corporation in the Pittsburg district and fully 50,000 acres of coal land will be developed. The first mine will be opened in the Panhandle field, 14 miles from Pittsburg. In this district 7,500 acres are controlled, while in Washington county there are 15,000 acres of undeveloped coal properties. The plants of the United States Steel Corporation in the Pittsburg district require nearly 3,000,000 tons of coal annually and this property will be opened up and developed as fast as possible in order that none of the expiring contracts with outside coal interests be renewed.

Advance for Puddlers and Finishers.

As a result of the bi-monthly bar iron conference held at Youngstown, O., this week, the puddlers and finishers in all the mills controlled by the Amalgamated Association of Iron, Steel and Tin Workers of America are granted advances. The wages of the puddlers are advanced from $5.50 to $5.75 per ton and that of the finishers from 67 cents to 68.5 per ton. An examination of the sales sheets for the past two months showed that bar iron had been selling on a basis of 1.5 cents per pound. These are the highest wages paid the puddlers and finishers for more than a year. The examinations of the sales sheets of the American Tin Plate and American Sheet Steel Co. were made last week, but the prices prevailing during the months of November and December warranted no advance.

Connellsville Coke Output in 1901.

Figures given by the Connellsville *Courier* show the shipments of coke from the Connellsville region in 1901 to have been 12,609,949 tons. This exceeds by about 25 per cent the banner outputs of 1899 and 1900, which were 10,129,764 tons and 10,166,234 tons respectively. Quotations for furnace coke ranged from $1.75 to $2 at the oven at the opening of the year and from $2 to $2.25 at the close. The average selling price for the furnace and foundry coke shipped during the year is put at $1.95 at the oven, giving a total revenue for the year of about $25,000,000.

A newspaper dispatch from Sharon reports that the Sharon Steel Hoop Co. will shortly add an open-hearth plant and build two additional mills for the production of hoops and cotton ties. The report is not officially confirmed.

The project for blast furnace and coking plants in Cleveland, which was thoroughly investigated by a number of Cleveland capitalists and engineers last year has been given up, the options on an eligible tract of land having been allowed to lapse.

A dispatch from Columbus, O., says that R. S. Warner, formerly president of the Republic Iron & Steel Co., is associated with Pittsburg capitalists in a plan for a steel plant at Columbus. It is intimated that both steel castings and rolled material will be produced. Mr. Warner does not give details further than to say that a mill will be built.

Announcement is made that the excellent semi-monthly publication *Mining and Metallurgy*, of New York, has been consolidated with the *Engineering and Mining Journal* of New York. W. J. Johnston, heretofore publisher of the former journal, has been elected president of the Engineering and Mining Journal, Inc.

A Duluth dispatch refers to a discovery of magnetic iron ore in Canada, about 60 miles north of the Atikokan range. A. R. McFarlane, of Duluth, and others are interested and a tract of 4,000 acres has been taken up. The outcrops have been traced for seven miles and iron ore deposits of laminate structure have been found on the shores of a lake in the new region, analyses showing a high iron content.

The Brown Corliss Engine Co.'s plant at Corliss, Wis., is practically completed, all the machinery having been installed, and it will commence work on its first order next week.

THE SHARON STEEL COMPANY.

The *Financial Chronicle* of New York publishes the following information concerning the Sharon Steel Co., Sharon, Pa., which is an interesting resume of the various properties and subsidiary companies, with their financial status :

"This company, which was incorporated about two years ago (October, 1899), has proceeded so quietly with its plans that comparatively few persons appreciate how extensive are the plants which have been and are being established by it at Sharon, Pa., or how thoroughly the company has entrenched itself by the acquisition of ore lands on the Mesabi Range, and of coal, coke and limestone properties in Pennsylvania. It will presently have an output of 1,000 tons daily, the product including, besides billets, etc., wire and rods, steel pipe, tin plate and sheet steel, viz :

Blasts.	No.	Daily Capacity, In Operation.	Tons. Under Contract.
Blast furnace	1	600	.....
Open-hearth furnaces	12	(8) 800	(4) 400
Blooming mill	1	1,000	.....
Billet mill	1	700	.....
Wire mill	1	400	.....
Pipe mill	1	.....	300
Tin mills	20	200	.....
Sheet mills	10	.....	(10) 100

"Through the Sharon Ore Co. control has been acquired of iron deposits on the Mesabi Range which are estimated to contain about 20,000,000 tons of ore; through the Sharon Coke Co. the ownership has been obtained of 1,300 acres of coal and 200 acres of surface land in Fayette county, Pa., and through the Sharon Coal & Limestone Co. large tracts of coal and limestone property have been purchased in Mercer, Butler and Lawrence counties, Pa.

"The Sharon Steel Co. recently issued $500,000 additional stock, making $4,500,000 outstanding, in $100 shares, all of one class. The total authorized stock is $5,000,000. In addition bonds have been created as follows :

"$1,000,000 5 per cent 1st mortgage, gold, sinking fund, subject to call at par after October 1, 1910; $1,000,000 5 per cent 1st mortgage on tube mill, 2d mortgage on other property, subject to call at 105 prior to June 1, 1911, and at par after June 1, 1911; $1,250,000 Sharon Coke Co. 1st mortgage 5s, subject to call at par after December 1, 1906.

"Toward the ultimate redemption of bonds of 1900, $250,000 has been deposited with the Union Trust Co. of Pittsburg, trustee.

"The capital stock of the subsidiary companies is as follows :

	Capital Stock. Authorized.	Issued.
Sharon Coal & Limestone Co.	$200,000	$200,000
Sharon Coke Co.	2,500,000	(?)
Sharon Ore Co.	300,000	200,000
Sharon Sheet Steel Co.	500,000	500,000
Sharon Tin Plate Co.	800,000	800,000
Sharon Steel Tube Co.	2,000,000	1,000,000

"The Sharon Steel Co. owns all the stock of these companies except about 33⅓ per cent of the Sharon Coal & Limestone Co. and 40 per cent of the Sharon Tin Plate Co.

"In April last George W. Darr succeeded Frank H. Buhl as president of the Sharon Steel Co. The company, we are assured, is not dominated by the United States Steel Corporation.

"President George W. Darr has confirmed the following : 'A contract has been made with the Consolidated Lake Superior Co. calling for the delivery to the Sharon Steel Co. of 250,000 tons of Helen iron ore, at the rate of 50,000 tons per annum. The directors have authorized the immediate erection of two blast furnaces, with an aggregate capacity of 700 tons a day, raising the company's total pig iron capacity to about 1,200 tons daily. The work on the plant of the Sharon Tube Co., a subsidiary concern, is being rapidly pushed. It is expected to be in operation by June 1. The 12-mill sheet plant of the Sharon Sheet Steel Co. is progressing, and will probably be working on May 1. It has also been determined to add four additional open-hearth furnaces to the present equipment of eight furnaces.

H. S. Pebbles announces that he has resigned his position as traveling salesman for the Howe-Brown Dept. of the Crucible Steel Co. of America, at Chicago, to accept a similar situation with the Colonial Steel Co., with offices at 610 and 612 Northern Office Bldg., Chicago.

PERSONAL.

S. A. Williamson, for the past three years Pittsburg representative of the Heine Safety Boiler Works, has resigned and will become the Chicago representative of the Erie City Iron Works, Erie, Pa., selling its water tube boilers.

Thomas Hamilton has resigned as superintendent of the Joliet Stove Works, Joliet, Ill.

Arnold K. Reese, manager and superintendent of the furnaces of the Lebanon Furnace Co., Lebanon, Pa., has tendered his resignation to become effective Feb. 1. Mr. Reese has accepted the position of manager of the furnace plant of Gust, Keen & Co., Cardiff, Wales. He has had charge of the Lebanon furnaces for the past year and a half, having gone from Sparrows Point, Md., where for seven years he was manager of the blast furnaces of the Maryland Steel Co.

The first annual reunion and banquet of the veteran employes of the Westinghouse Airbrake Co. was held at the Seventh Avenue Hotel, Pittsburg, last week. Informal addresses were made by R. 15. Scandrett, H. H. Westinghouse, John Caldwell and Daniel Ashworth.

Joseph Rayser, of Youngstown, O., formerly superintendent of the Laura furnace at Haselton, O., has been appointed manager of the furnace of the Graham Iron Co., Graham, Va.

P. D. Mackey, for 22 years an employe at the Edgar Thomson plant of the Carnegie Steel Co., Braddock, Pa., has resigned to accept the position of superintendent of the converting mill of the Bessemer plant of the Republic Iron & Steel Co., Youngstown, O.

Roger Bowman, superintendent of the shipping department of the Duquesne Steel Works of the Carnegie Steel Co., Duquesne, Pa., resigned this week. Mr. Bowman was one of the oldest employes of the company at Duquesne, having been in the company's employ for 34 years.

On Saturday evening, Jan. 4, the heads of the departments of the Youngstown district of the American Steel Hoop Co. were given a banquet at the Tod House. Those present were: I. W. Jenks, of Pittsburg, general manager, who gave the banquet in behalf of the company; E. E. Slick, mechanical engineer; M. E. Coombs, district manager; R. R. Lawson, district paymaster; C. C. Blair, chief clerk of the Youngstown mills; George Higley, chief of order and shipping department of the Valley district; C. P. Edwards, superintendent of the lower mill; Thomas Paget, first assistant superintendent of the lower mill; Powers Wick, second assistant superintendent of the lower mill; Harry Parrock, superintendent of the upper mill; Myron Phillips, first assistant superintendent of the upper mill; Paul McCaslin, second assistant superintendent of the upper mill; Albert Morris, general roll turner; W. W. Wilson, superintendent of Girard mill; and Isaac Howells, his assistant; John Bennington, superintendent of the Warren mill, and Thomas R. Smith, superintendent of the Greenville mill.

F. Baackes, general sales agent, American Steel & Wire Co., Chicago, entertained representatives of the sales departments of the New York and Worcester offices, and heads of the sales department at Chicago, at a dinner at the Technical Club, Chicago, Friday night.

A. L. Hammerberg of the Tennessee Coal, Iron & Railroad Co. of Ensley, Ala., has been appointed chief mechanical engineer of the Youngstown Iron Sheet & Tube Co. He was formerly of the Duquesne works of the Carnegie Steel Co., and later with the Wellman-Seaver Engineering Co., Cleveland.

Robert Coates, formerly chemist at the Valley furnace of the Republic Iron & Steel Co., Youngstown, O., has been appointed assistant superintendent of the Hall Furnace of the company at Sharon, Pa.

Price McKinney, of Corrigan, McKinney & Co., Cleveland, has returned from a trip to the Mexican mines of the company. James Corrigan is still in Mexico.

The plant of the Maryland Sheet & Steel Co., Cumberland, Md., commenced operations this week on three mills. The fourth mill will be placed in operation shortly. The mill is equipped to roll the heavier gauges of sheets.

S. B. Moore, the well known Pittsburg accountant, and for many years auditor of the Carnegie Steel Co., has been appointed auditor of the Pressed Steel Car Co., of Pittsburg, Pa.

SUGGESTED AT THE SHOP.

BY F. O. REMAN.

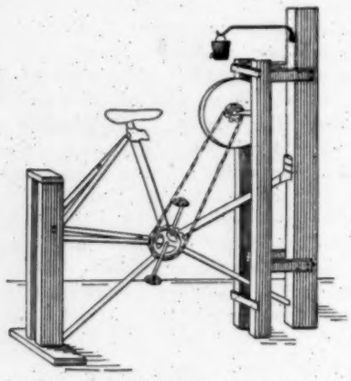
It is an everlasting puzzle where many of the products of our modern high-pressure machinery come to a finish. The rows of machines cutting up tons of wire into wood screws or nails seem in number and amount of output well able to swamp the demand. New inventions come along and the speed of the machines is quickened but there's no let up in the demand for a staple article. This is not the case with machines, tools or other things that depend upon a short-lived fad for existence. Take the roller skate for example. Just imagine the amount of money that went into the old-time skating rinks. The resorts sprang up all over the country and the craze spread abroad. Inventors galore were at work on wheels and the patent office was deluged by a flood of applications for bearings, wheels, automatic adjustments of the axles according to the changing influence of the load, and many other avenues for improvement and novelty.

* * * * *

The fad ran its course and then slumped. The old buildings were made over and served some other purpose in the hustling world. I remember one of them was turned into a very good machine shop and another came in handy as the home of an electric lighting plant. The other apparatus went out of sight and maybe followed the craze across the seas. It did not fit with the fancy of the new generation and was forthwith wiped off the slate.

* * * * *

The bicycle business has had a similar history and it would puzzle anyone to explain why the numerous reasons given a few years ago as explanation for the popularity of the wheel seem to cut so little figure now. Every mechanic owes a debt to the wheel just the same. It gave a host of new jobs to the tool-maker and the demands of that branch of the metal-working trade for screw and milling machines, ball making



A NOVEL GRINDSTONE ARRANGEMENT.

machinery, presses, etc., made a big market for jigs, fixtures and die work generally. It taught us a lot about chain drives and this style of gearing has been perfected to a point where it is being used on high grade machinery—machinery of a class far and away beyond the old estimate of chain driven mechanism.

* * * * *

But that does not explain how the old bicycles are now used. Most of them are stacked away in out of the way places on the indirect road to a scrap heap. A few may serve a useful purpose and I have heard weird tales about their power-supplying qualities when hitched to an appropriate machine. One of these is shown in a copy of the *American Blacksmith*, and the designer describes his grindstone arrangement somewhat as follows:

* * * * *

"In rigging it up I first cut out the middle brace of the bicycle and then with a 2x4 timber made the rear support. Then I stapled the front of the bicycle to a stout post and made a frame for the grindstone, bracing the bicycle frame underneath. By cutting the spokes out of the rear wheel I secured the small sprocket; fitted a piece of wood into the square hole of the grindstone, bored a hole in the wood the size of the sprocket axle and fitted the axle in the stone. As the stone is placed high it was necessary to obtain two chains and join them together. This machine is now a handy ball-bearing grindstone which runs at lightning speed and costs but little to make."

* * * * *

This affords a way of using up the old wheels and at the same time enjoying some of the wonderfully beneficial exercise that has been credited to the user of the bicycle. A man can do his century run and stay by his job. If he wants to climb hills, try uneven roads, or any other way of varying the ride, he can make the stone to suit and take it out in the grind. This is not the whole story by a lot. The grindstone is one of the most abused tools about the plant and is of no interest generally. It's time that it should be considered a machine tool, with good light; no meager, miserly driblet of water, trickling from a toy nail, on its honest and homely face, but a steady stream that pours at the point of tool application. I have had it on very good authority that a grindstone should not run fast enough to spatter the water around the machine, but it is better to provide for the flying fluid another way and drive the machine full speed.

* * * * *

The grindstone, or emery wheel mounted on ball bearings,—placed high so that you can see where you are at, and withal driven lively, will start a new state of mind in the shop. It will put a keen edge on everything and everybody. It may not be the whole thing but it will do a good share of the work in grinding down the rough spots and sharpening the blunt places in the productive machinery.

* * * * *

I should not mix too much exercise with the grind and so I would discard the bicycle part. All things considered the easy way is the best way and the shop foreman keeps up a constant thinking how much easier a job can be done, and in this case it pays to get a machine fully worked out by the other fellow. It's cheaper to buy a center punch than to make one. Perhaps the grindstone has been kept in the background too long for any improvement to give it a competitive chance beside other abrasive wheels. But lightning speed and ball bearings are steps in the right direction and the grindstone may yet come out of the corner by the scrap heap and take a prominent position with its oldtime co-worker, the lathe.

A Chance for British Locomotive Builders.

American Locomotive has announced to an intended buyer of locomotives that the earliest deliveries could not be made before ten months.—[Wall Street Journal.

Now is the time for the British locomotive builders to get back at us. We have been told a good many times that orders came here mostly because the British builders were too busy to make prompt deliveries. Now they ought to send their agents over here and take contracts to be delivered in six months. That would add to the interest of life and to the gayety of nations.—[Railroad Gazette.

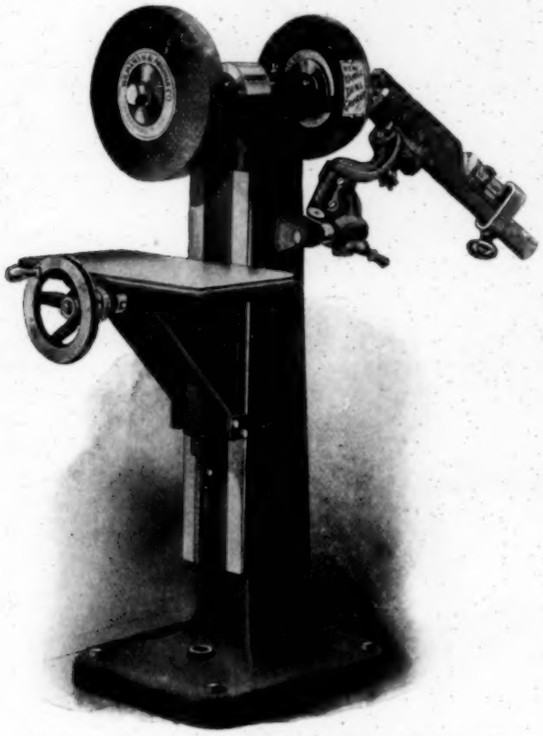
John F. Allen, 370-72 Gerard Ave., New York, has received an order for fifteen boiler riveters from the American Car & Foundry Co.'s Milton, Pa., plant. These machines are to be used on oil tanks for car service. The Western Railway Equipment Co., St. Louis, has also placed an order for ten machines of the same kind and for the same kind of work. Each order calls for an equal number of Allen's boiler saddles, used in turning boilers and tanks. The demand now upon this concern will tax its present capacity for at least two months and has forced it to enlarge. An addition now under way will give 2,000 additional square feet.

The Standard Pneumatic Tool Co., Chicago, has appointed W. H. Tew managing director of the company's office in Germany, and will have headquarters at Klosterstrasse, 13-15, Berlin. The company intends to erect a large plant in Germany, and is now purchasing machinery for these works. Mr. Tew was formerly connected with the Brooks Locomotive Works, Dunkirk, N. Y., and later with the mechanical engineering department of the Chicago & Northwestern Railroad.

A NEW TWIST DRILL GRINDER.

The common use of twist-drills has suggested the necessity of a more modern method of grinding the cutting edges than is afforded by the old hand process. The imitation of hand work is in most instances a difficult problem and the embodiment in a machine of the skill required to grind a drill accurately requires a nice appreciation of the obstacles combined with good mechanical ability. Some of the solutions offered to the problem have required gage jaws, caliper devices, chucks or other adjusting appliances, but in the machine here illustrated the arrangement of the parts has been so designed that results are reached automatically that are obtainable in others only by numerous adjustments. No preliminary adjustments are required for the grinding of any drill within range of the machine, as all it is necessary to do is to drop the drill into the V-shaped holder, and adjust the tailstock to suit the length of the drill. An important feature of the machine is the variable clearance device. By loosening the hand wheel on the under side of the drill holder it may be instantly adjusted on its curved bearing and any desired clearance obtained; the same clearance angle holding good upon every size of drill that can be ground in the machine.

The accompanying illustration shows the latest production in twist-drill grinders, in which the makers have succeeded in



COMBINED SURFACE AND DRILL GRINDER, STYLE "R."

getting much usefulness into a small space, the machine being designed for both surface and drill grinding. Nearly all combination tools can be used for only one purpose at a time, but to this machine no such objection can be raised, as its use for either drill or surface grinding does not in the least interfere; both sides of the machine being capable of simultaneous operation. The wheel for surface grinding is 12 inches in diameter by 1½ inch face, and is central over a table 10 inches wide and 18 inches long and can be lowered 20 inches below the spindle or 14 inches under a 12-inch wheel. The drop is obtained without having to bore a hole in the floor for the elevating screw. This screw is geared to the hand wheel shaft through a pair of accurately cut mitre gears, and a dial graduated to thousandths insures fine adjustments. The table is properly gibbed to the slide or column and the oil holes leading to the bearings of the hand-wheel shaft and thrust bearing of the elevating screw are well protected against entrance of grit. One side of the machine can be equipped for plain tool grinding instead of drill grinding when so desired.

The machine is built by the Wilmarth & Morman Co., manufacturers of Yankee drill grinders, Grand Rapids, Mich.

OLDEST OF PITTSBURG IRON MANUFACTURERS.

On Monday morning, Jan. 13, Christopher Zug, the oldest of the pioneer iron manufacturers of Pittsburg, passed away in that city in his 95th year. Although blind for several years, Mr. Zug took a lively interest in affairs, and only two weeks ago visited the plant of Zug & Co., which he founded. Upon returning home he almost immediately took to his bed and quietly passed away, death being due to old age.

Christopher Zug was born July 19, 1807, in Allen township, near Carlisle, Cumberland county, Pa. He was a son of Jacob and Margaret (Keller) Zug, and his ancestors came to this country from Switzerland about 1727. His grandfather, Christian Zug, settled in Pennsylvania, near the site of Lititz, upon land which was granted to him by the Penns and which still is held by the Zug family. The parents of Christopher Zug were born near Lititz, the father in 1767 and the mother ten years afterward. His parents were in comfortable circumstances and Christopher received his first education in a school house which stood upon his father's farm, in South Middleton. He later went into the dry goods business at Carlisle, but sold out after two years, and started in 1835 for Pittsburg, traveling from Harrisburg by the canal route. He obtained a position with S. Fahnestock & Co., wholesale hardware merchants, as bookkeeper, but after he had been there two years the firm failed, and young Zug went

to work for Hoge & Hartmans, iron manufacturers, and here he obtained his first ideas of iron manufacturing.

He subsequently worked for James Anderson who in 1846 sold out to Graff, Lindsay & Co., the partners in that firm being Henry Graff, John Lindsay, William Larimer, Jr., and Christopher Zug. The mills at that time employed about 300 men, the business consisting chiefly of the manufacture of iron and nails. In 1854 Henry Graff withdrew from the firm, which then became known as Zug, Lindsay & Co. In 1856 John Lindsay died, leaving the business to Mr. Zug and Jacob Painter, under the firm name of Zug & Painter. In 1864 Charles H. Zug, a son, was taken in as a partner and the firm became known as Zug & Co. In July, 1896, the firm, which comprised Christopher Zug, Charles H. Zug and T. C. Clarkson, was increased by the addition of C. H. Reid. The mills of Zug & Co. are situated at Thirteenth and Etna streets and extend parallel with the river to Pike street. Several new buildings have been erected since Mr. Zug took charge in 1856 and about 750 men are now employed.

On May 17, 1831, Mr. Zug married Miss Eliza Bair, of Hanover, York county. His children were: Charles H., the only son; Margaret, wife of James H. Parker, of Chicago; Emma, who died at 12; Eliza, wife of Thomas C. Clarkson; Mary, deceased, who was the wife of Harvey Childs, of Pittsburg; and Annie, wife of Edward Burdett, of New York. Mrs. Zug died in 1866.

THE ANGELL WIRE NAIL MACHINE.

The Angell Wire Nail Machine Co. has been organized recently in Cleveland to put on the market a new machine for the manufacture of wire nails. The methods in use for wire nail production are fairly familiar to the iron and steel trade and has greatly improved the general usefulness and efficiency.

The half-tone Fig. 1 is a view of the machine taken from a point sufficiently elevated to show the main details of the mechanism in the plan. Fig. 2 is a view taken from the flywheel side of the machine and Fig. 3 gives a detailed plan

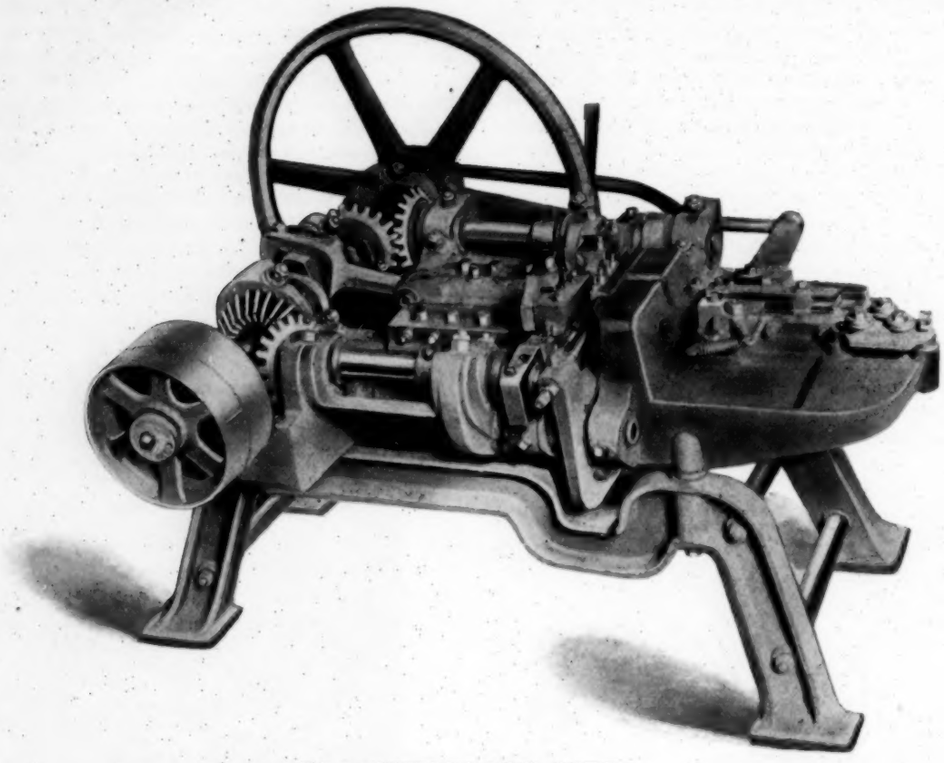


FIG. 1.—ANGELL WIRE NAIL MACHINE.

and the several machines in common use have been brought to their present state of efficiency by a long evolution with the aid of the fault-finding agencies of a keen competition, unskilled labor and high duty. The weaker elements have been removed by constant pressure and the survival of the fittest.

reproduced from the working drawing of the assembled parts. Fig. 4 illustrates a group of parts showing the means employed to lengthen the working life of the vital members of the mechanism.

Taking up the construction of the machine, it is readily un-

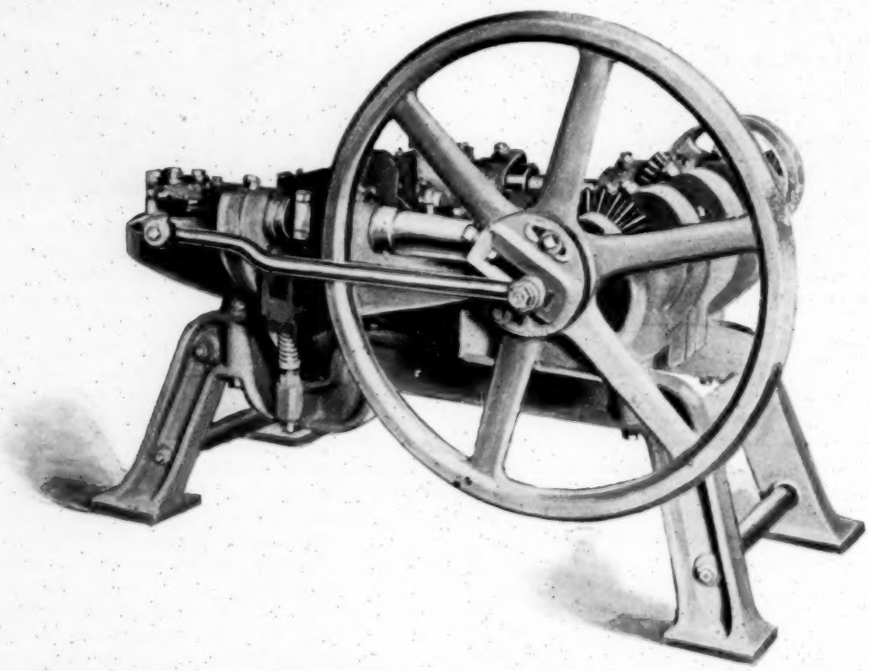


FIG 2.—ELEVATION OF ANGELL WIRE NAIL MACHINE.

The modern wire nail machine is therefore capable of being rushed at a rate that is simply amazing to anyone unacquainted with this class of mechanism. The speed rate is of course limited by practical considerations, and the inventor in this case has taken the several features of the machine in hand

derstood that the power is applied by belt to the shaft A, having a crank operating a connecting rod B and slide, the latter provided with a heading die attached at C. D D are bevel gears driven from the shaft A. These gears are covered by a bonnet, as at E, when the machine is in use, but the cover

has been removed in order to show the connecting elements in Figs. 1 and 2. The gears D operate short shafts on each side of the machine, having eccentrics G. These drive two sliding die-holders simultaneously back and forth, the dies at every stroke forming the point of a nail and cutting it from the rest of the stock. The dies for this service are made in halves and must match closely or the end of the nail will be far from having a neat point and the rapidity of the machine in operation means considerable injury to the quality of the goods when anything needs adjustment or there is an equal loss by reason of long delay in making the necessary repairs. On examining the die-holders in Fig. 3 it will be seen that adjusting screws are provided for movement in every direction, that these can be reached from the top of the machine and that everything is in plain view of the workman.

slide M which is reciprocated by means of the connecting rod pivoted at the crank pin N. Thence the wire is led through the slot in the bed to the gripping dies worked by the cam H and held while the heading die C strikes a blow on the end of the stock, forming the nail head at the time that the vise L is moving back for another grip. The cam H rotates, releases the gripping dies and another length of wire is pushed forward by the slide M, and the vise L; the eccentrics G G then point and cut off the completed nail which drops into a hopper.

The several operations must be carefully timed and adjusted and these essential features in a successful machine are complicated by the rigor of the service. The motion of the slide, for example, limits the length of the nail; and the travel of the vise must not only be a definite distance and easily capable

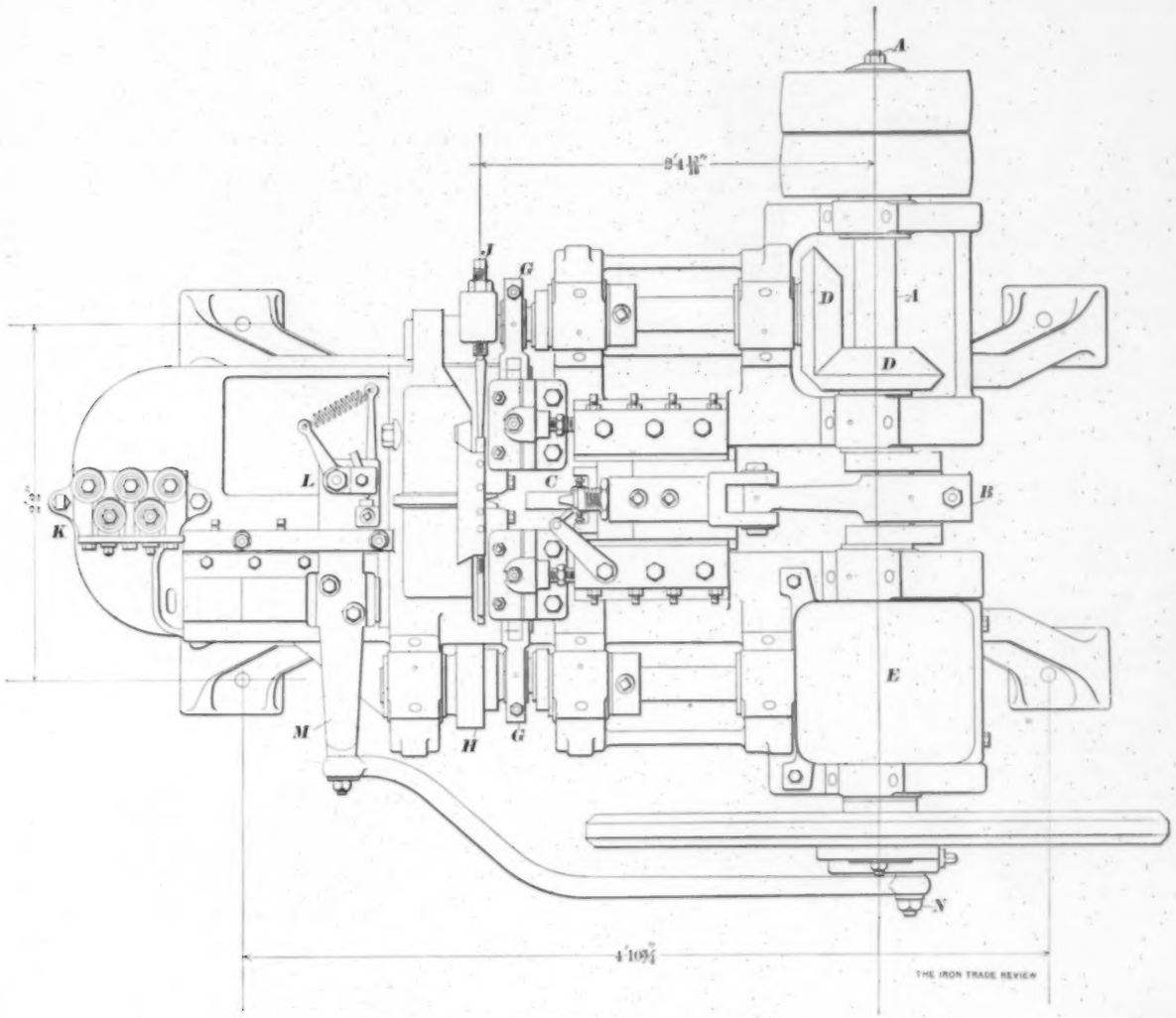


FIG 3.—PLAN OF ANGELL WIRE NAIL MACHINE.

There is a cam at H driving a long lever which is carried under the machine and pivoted on the other side near the adjusting screw J. This lever is shown more clearly in the upper part of Fig. 4. The cam H rests on a roll and by means of the lever and the adjusting screw J two dies are forced together, firmly gripping the wire while it is headed and at the same time putting the familiar impressions on the shank of the nail under the head. This service is necessarily severe and the improved method handles the work with a sufficient leverage at the point of application to allow the machine to run cool and there is not the destructive pressure developed with some other methods of doing this work. The cam acts against a spring which returns the lever when releasing the dies. This spring is shown in Fig. 2.

The wire is fed from the reel through the straightening rolls at K in Fig. 3. These are equipped with slides and collar screws for quick handling. The wire is then inserted between the jaws of the spring-actuated vise at L. This is fitted to the

of adjustment for any wear of the parts but arranged to occur exactly at a prescribed period with due reference to the other cycles of the moving elements. This is best seen in Fig. 2 where the connecting rod from the slide is shown attached to the crank pin. The crank pin is adjustable in a slot running across the center of the plate and the latter has circular slots so that the position of the crank pin may be changed relatively to that of the crank working the heading die and the throw increased or decreased at pleasure. It is convenient to take hold of the fly-wheel when making these adjustments, and the shape of the rim is not circular, which would be difficult to true up in the lathe, nor square, which would be equally unhandy on the completed machine. An average has been sought for both and the rim is octagonal in section.

Fig. 4 shows the grip lever already mentioned in the description of Fig. 3 and also shown in Figs. 1 and 2. Immediately below the lever is seen the heading die C, slide and connecting rod B, assembled and in detail. The slide T is

cut out to fit the thrust block S which fits against a machined surface at V on the end of the connecting rod B. The pressure therefore does not come wholly on the pin, coupling the slide and connecting rod together, but is borne by a greatly increased area of contact. The heading die C is also capable of ready adjustment by means of the check nuts and screws shown in the engraving.

It is claimed that the machine has given an output of 84 pounds of four-penny nails to the hour and 330 pounds of ten-penny nails in the same time.

SPECIALIZATION IN BOILER SHOPS.

It is but half a generation ago that most any boiler shop of this country was equipped and accustomed to undertake the manufacture of any form of boiler, tank or plates construction then in use. But now, specializaiton in the boiler shops is progressing so rapidly that certain features should be considered by those who take serious thought as to the future.

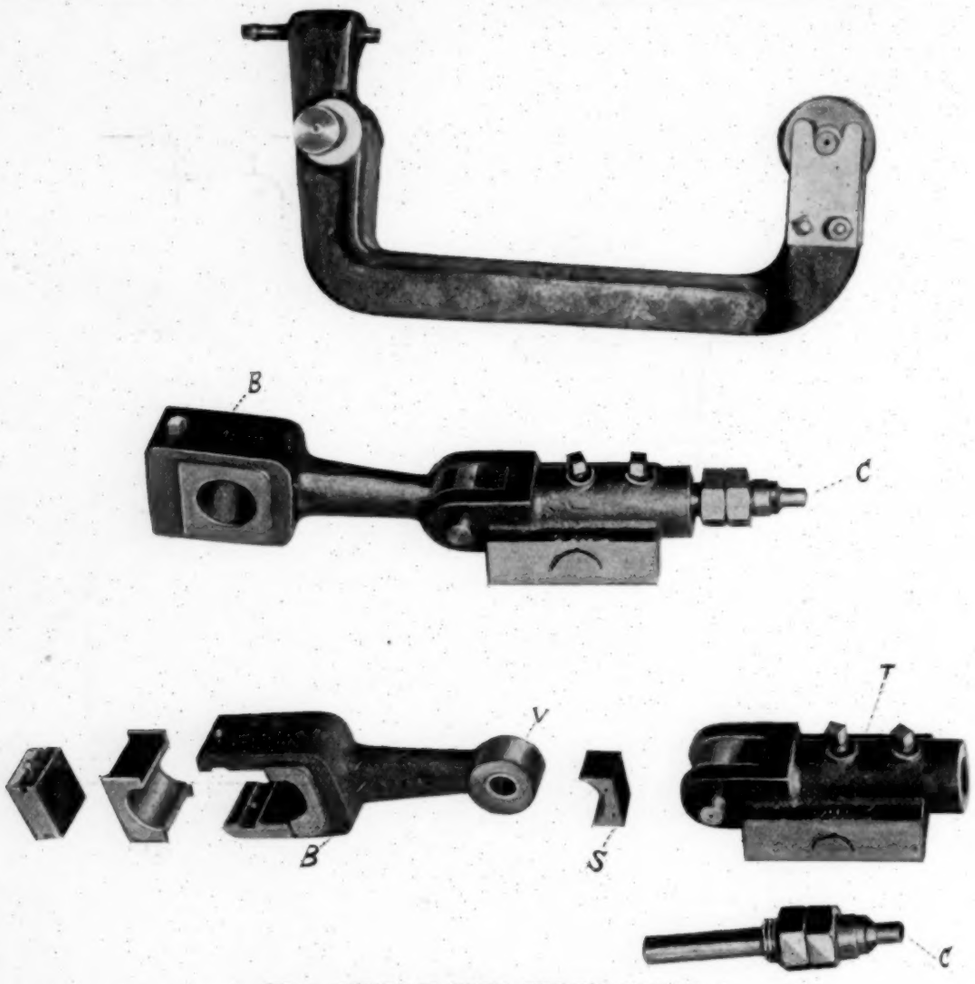


FIG. 4.—DETAILS OF ANGELL WIRE NAIL MACHINE.

In the making of steel tanks for storage of grain or liquids or for their transportation, there is now a distinct trade, employing tools and methods in fabrication and erection peculiar and individual to themselves. While the shops engaged in such work, as a specialty, lack the men or equipment necessary to repair their own boilers, yet in their own department they are fearless of the competition of the boiler manufacturer formerly engaged in this work. In these "tank shops" the journeyman boiler maker finds no employment.

In the manufacture of boilers, specialization has made its greatest progress and the development of economies, through duplication, with maximum output, is most marked. Thus it is, that the largest shops are in small towns, or just outside the large cities, where there is practically no repair work. No longer are journeyman boiler makers needed in such establishments; the men are set at one task, at which they continue, without changing, for months or years. Their skill in one simple operation thus attains a high degree, but unfits them for the varied demands found in the small or repair shops.

It is told that, in one of the largest boiler manufactories in this country they had to go outside their own works to get men to repair their own boilers. With this development of economical manufacture, comes organization in selling, advertising and buying, and this brings in contrast the city shop. Here, every kind of work is found, unusual or experimental, varied repairs have to be made by day or night, so interruptions are frequent and men are irregular in kind or duration of employment. Trades' Unions affect wages and hours, and the highest paid labor has to be employed in order to provide for every possible contingency. Thus, the large boiler shop, of the city, that undertakes general repairs, finds its costs compare so unfavorably with its out-of-town competitors as to make it evident that there is a "parting of the ways" before them.

Briefly, the city boiler manufacturer, who continues to do general jobbing and repair work, will be gradually compelled to curtail his tonnages and abandon large contracts. We know of several cities where prominent boiler manufacturers buy the bare boilers, from out of town, and look for their profit on their installation.

There are some large manufacturers, in many cities, who, with a strong personal following, and through years of honorable business, will be able to resist awhile and competition of the "specialized shops," but with the passing of the old heads, the younger blood will use less sentiment in placing their contracts. And so it will be that those concerns, who, through ability and resource, and a desire to keep in business, are able to carry on large enterprises, will have to separate the new work from the old by a compiete division of their plants.

It means a struggle, which is involved in every form of growth; brains to conceive and money to execute are needed. Manufacturing ability is good, but wise selling capacity is better. The future has little room for the timid one, the "one talent" man; but to him who believes in himself and his fellows, and who plants widely and wisely, a fair harvest is assured.—[The Boiler Maker.

AN ENGLISH MACHINIST ON SHOP CONDITIONS IN THE UNITED STATES.

[R. J. J. Swan, in London Engineering.]

In the following article the writer will endeavor to give a brief account of his experiences of modern American practice in their most up-to-date workshops. After working in English shops he visited the United States with the intention of seeing their latest methods. He worked as a fitter and planer-hand in two of their most modern tool shops, and visited over thirty others. He had thus better opportunities for observation than the casual visitor, who usually comes back with the impression that America is first and England nowhere. This comparison is unfair, because anyone can get round the most up-to-date shops in America, which is not the case in England. English firms are conservative, and do not encourage visitors; whereas the reverse obtains in the States, where visitors are gladly shown round. The average American also begs the question by asserting that she is first. America is a young country, and suffers from a lack of self-confidence, like a young child who is always saying to all comers anent its latest toy, "Isn't this a pretty thing?" etc. She is not yet quite sure of her position among the nations, and likes to ask everybody what they think of her, at the same time pointing out where she thinks she excels all others. This, in the writer's opinion, is the true cause of American "brag," and is written in all good feeling towards the States, where he was shown much kindness.

English and American Workmen Compared.

In the first place, it may not be amiss to institute a few comparisons between the American workman and his English cousin. The first feature that strikes a visitor is the comparative absence of drunkenness. Climate has a large effect on a man's character; and one can hardly blame an English workman for requiring a stimulant on a dreary day, the like of which is experienced in all manufacturing towns. It is not so much the fault of the man as of the climate in which he lives. Human nature is pretty much the same all the world over, and the difference between the Englishman and American as individual men is very slight. They have both several tastes in common, such as slacking off when the foreman's back is turned, grumbling over their jobs and pay, and many other similar failings.

Trades unionism has not the same hold over the men as in England. The reason of this is not difficult to determine, and may be attributed to three general causes: 1. The mixed races. 2. Alien immigration. 3. System of apprenticeship. With regard to the first cause, a gang of fitters in which the writer worked was composed of the following races: Native-born American, Canadian, Scotch, Irish, German, Swede, Dutch, and Austrian. Among such a mixture of races union was well-nigh impossible; as, although all officially spoke English, the language on ordinary occasions resembled that of the Tower of Babel. Alien immigration prevents union, as may be readily seen. The apprentice system in the States is very lax. Most shops have apprentices who serve for four years; but with few exceptions they do not object to put a man on any job, provided he can do the same to their satisfaction.

In the Eastern States, such as Pennsylvania and Connecticut, the influence of trades unionism is very slight; in fact, it is almost non-existent. West of the Ohio it becomes more powerful. A fitter told the writer that a friend of his was unable to obtain work in Dayton, O., on account of his not belonging to the union. In Chicago, as is well known, the unions of all trades are very powerful. About Chicago trades unions the following tale is told: A mason, in his spare time, started to paint part of his house. He thereupon received a letter from the painters' union to the effect that unless he employed a painter to do the work, they would use their influence to get him discharged from his present job. This, like a good many other American tales, requires a fair dose of salt for digestive purposes.

An American workman has no objection to running two or more machines. His wages are higher than over here; but at the same time he works longer hours. The writer got 47s. a week of 59 hours for running two planers in Hartford, Conn.

As regards his personal appearance, the American workman is very particular. When he enters the shop in the morning, he is dressed in his best Sunday clothes. Before the whistle has blown, he has, in many cases, removed his white shirt and other fine articles of wearing apparel, and donned old clothes and overalls. Before leaving for his dinner, he has a good wash with soap and water, and changes his overalls for his wearing clothes. The majority of the men go through the above operations.

The American overall is neat, being made of blue material with a white stripe running through it; the trousers have a flap, which protects the chest of the wearer if the weather is too warm for a smock. In connection with clothing, the writer found cheap clothes as cheap as in England; but articles requiring care and much hand work in manufacture are much dearer.

A very few words will describe the American foreman. The only difference between the English and American foremen is that there are more of the latter for a given squad of men. The men are engaged by the superintendent or manager, instead of, as in England, by the foreman.

Shop Equipment and Conditions.

It is a common cry in the press just now that England is decadent, and that this decadence is partly caused by the masters of engineering shops not having their shops equipped with the very latest up-to-date machinery. This cry is unjust in as far as it blames Englishmen with a lack of engineering ability. The proper equipment of engineering works is quite as much a question of finance as of engineering ability. The average American shop is a modern production, and its equipment is of the period in which it started—i. e., up-to-date. Old shops in America are as badly off in the matter of equipment as old shops in England. The reason of the poorer equipment of old shops is mainly because they have served their purpose in making, for their founders, fortunes, upon the interest of which their successors live. The latter still keep the firm running, but are averse to putting in fresh capital, the return of which they would never see in the event of their selling out or closing down. As in other things, there are many brilliant exceptions to the above, where the successors have had a natural taste for engineering.

The American working week varies, but averages about 59 hours. All works start at 7 a. m., stop at midday for either three-quarters of an hour or an hour, when work is resumed until 6 p. m. On Saturday some works stop at 12 noon and others at 5 p. m. The opinion among the men is in favor of a Saturday half-holiday. In most shops a man is allowed to enter at any time in the morning, and his time counts from the next half hour. Much more overtime is worked than is the case in this country; in one shop in which the writer was engaged, the fitters worked till 9 p. m., three nights a week.

As regards time-keeping, in the majority of shops the men punch a time-clock on entering and leaving the shop. This method works very well, but requires a timekeeper to prevent impersonation. A trick sometimes played, when the inspector is absent, is for each man to hold his key in until the next man has pressed his; this prevents the paper revolving, and so registers all the men up to time. Another method employed is for all the men to enter through a large gate, which is closed when the whistle blows; the late comers enter through a by-pass gate, and their times and numbers are taken. Each foreman also enters the time of men under him in a small book, to take note of when a man is absent the whole day.

Methods of Keeping Time on Work.

After time-keeping, the taking of time and apportioning same to each job may be considered. The usual plan is, as in England, for each man to enter the time taken on each job, along with his number, on a card, which is collected each evening and taken to the office. A much more accurate and simple method was employed in some works in which the writer worked. In the ordinary system in vogue the men enter their job, number, and time on a time-sheet; in this system, they enter their time on a job sheet. When a man gets a new job from his foreman, he receives a ticket (see sample annexed) from him, giving details of job, and upon which he enters his time. All the different jobs required to manufacture were catalogued and sub-divided into their various departments, such as foundry, smithy, machine shop, etc., in the cost office. When an order

was received for any given machine, a clerk in the office copied all the jobs into the tickets. These tickets were bound together, ready for despatch to the various foremen when necessary. A concrete example will illustrate how this system worked in practice. Suppose an order was received, say, for a 120-in. lathe, the drawings and patterns of which were to hand. The foundry foreman would receive a book of tickets containing all the jobs required to be done in the foundry, and

(TICKET I.)

Book No..... Page No..... Ticket No.....
Name. ..... Registered No..... Card No.....
Charge..... Group No.....
Job..... Cut ....

(*Description of Job.*)

Price..... Time..... Shop No. of Machine.....
....Foreman.

(BACK OF TICKET I.)

Return this ticket to your foreman every day you charge time to it.

Date.	Time.		Date.	Time.	
	On this Job	Total for Day.		On this Job.	Total for Day.

the date he was to have them finished by. He would distribute these tickets among the men in his charge as he best saw fit. Each man entered his time on the back of his ticket, and returned it to the foreman every night, or as soon as the job was finished. These tickets were frequently sent up to the cost office for examination, and the tickets of finished jobs were retained there. When the foundry work was sufficiently far advanced, which could be seen from the number of tickets retained in the cost office, the machine shop tickets would be issued to the machine shop foreman, who would apportion them among his men. The smithy tickets would be issued at the same time as the foundry tickets; the fitting tickets would be issued when work was sufficiently far advanced in the machine shop; and so on until the completion of the job.

On referring to the sample, the various headings will explain themselves, with the exception of the card number. This refers to the detail drawing number of the job referred to on the card. These drawings were supplementary to the ordinary shop drawings, and were kept in the tool room; in size they would be about 12 in. by 9 in., and were blue prints mounted on thin sheet iron. A check had to be deposited by a man on getting one of these drawings out, and he was held responsible for it while it was in his possession. For odd jobs, such as laboring or any extra work that might unexpectedly turn up, an ordinary ticket was filled up by the man on the job and sent up to the office. Each foreman was held responsible for the correct filling up of the tickets in his charge. The advantages of this method of time-keeping are many, among which might be mentioned the following: Accurate cost-keeping becomes merely a question of addition; no job can be started until the material is at hand; no job can be forgotten until too late; and the manager can always tell how the work is progressing by the number of tickets returned. Unlike many modern time-taking methods, it does not involve the necessity of extra clerical assistance.

Shop Arrangements Compared.

The tool-room is one of the most important features of modern American practice. Until recently it had no equivalent in an English shop. In the tool-room, all tools which require to be of a definite size or shape to perform their work, such as taps, reamers, milling cutters, drills, special lathe tools, and many others, are kept up to size, and stocked. These tools are being continually overhauled, and tested as to shape and size with micrometer gauges. The idea of the tool-room is to employ highly skilled labor to keep the tools accurate, and then to employ less highly skilled labor in the shop to run the machines. To obtain tools from the tool-room, a check has to be deposited for each tool taken out. A whole book might be written on the functions and management of a tool-room, but a lengthy description would be quite out of place in a brief sketch like this.

The proper heating, lighting, and ventilation of a shop are important factors in the amount of work turned out per man. Steam pipes were commonly used for heating, but in Cincinnati and Worcester, Mass., the following method was employed: In cold weather air was drawn into the shop through between the condenser pipes, which were placed in a large wooden box arrangement. This heated the shop, and at the same time helped to condense the steam. In hot weather, the air was drawn direct from the outside. Pipes conveyed and distributed the air to the various parts of the shop. This method insured plenty of fresh air, and kept the shop at a very even temperature.

For lighting, naked arc lamps were used, in conjunction with clusters of incandescents above each machine. In many shops gas was the only thing used. Naked arc lamps are not a good method, as the light is too intense locally, and too strong shadows are cast; where they were fitted, if particular work was being done, a man always used two or three candles.

The general arrangement of shops was pretty much as over here. A long, lofty, erecting shop, with side-wings abutting, was the general type, though some firms go in for five-story buildings. In the first case an electric crane spanned the whole of the large shop, while similar smaller cranes served the wings. The heavier class of tools were placed so that the large crane could serve them. Moderate-sized machines had each their own set of pullev blocks, suspended from an overhanging rail, and capable of travelling the whole length of the machine. In some of the smaller and newer shops, pneumatic cranes, capable of lifting up to 15 cwt., were employed. Their construction was simple, consisting of a suspended inverted cylinder, with piston and rod. The work was fastened to the rod, and air admitted to the bottom of piston, and the load was raised.

Pay days in some American shops are a constant puzzle to newcomers. In one shop in which the writer worked the men were paid on the fifth working day after the 1st and 15th of each month. Thus, when a Sunday intervened, the pay day was a day later than if such was not the case.

Some Novel Shop Kinks.

A few novel features the writer observed are worth notice. A few shops which the writer visited make a practice of annealing all cast-iron castings which are liable to warp. Every practical man knows the difficulty of planing a cast-iron strip, say 15 in. by 3 in. by ¾ in., to form a perfectly true surface, on account of the cooling stresses in the metal. Annealing prevents this, and a consequent saving is effected. The castings to be annealed are placed in a small reverberatory furnace, and left there from six to eight hours. They are allowed to cool slowly, and are then ready for machining. A large saving of time and material is thus effected, as can be seen if one takes into account the number of "scrapped" pulleys, etc., that can be seen knocking around most shops.

Paint on small articles was dried quickly by placing them in a tin-lined cupboard heated by steam. This dried the articles quickly, and did not blister or spoil the appearance of the paint in any way.

Cast-iron tools were used in some shops to turn shafting. The cutting edge was chill cast, and was ground up to a sharp edge. When worn out, the tools were remelted.

A neat jig for holding a casting of irregular form was used by one firm. It consisted of a casting like a shallow box, through the lid of which projected a large number of steel pins, which were held up by light springs. The casting was placed on the top of the pins, and each pin sank to its proper level, and then the pins were locked. By this means the casting was supported on a solid bed, and could be readily bolted down.

Electric chucks were sometimes used for holding thin strips, such as straight edges for grinding. They consisted of a flat iron plate, with the wires through which the current passed embedded in plaster in it.

For assembling the work for erection in shops which make light tools, a portable arrangement of shelves was used. All the various pieces required to complete the machine were assembled together in the store on this stand, which was then wheeled out to the erecting shop. For the tempering of a large number of similar articles, a pyrometer and proper heating furnace were often used. A brief account will now be given of the tools in general use in American shops.

Differing Spheres of Machine Tools.

Drill-grinders are universally used throughout the States.

This is largely due to the fact that the flat drill is almost unknown. The writer has heard many uncomplimentary remarks passed upon drill-grinders in general by English engineers, but this is because they have got hold of a bad type in particular. Like every other class of machine, there are drill-grinders and drill-grinders. One or two necessary points in this machine may be mentioned. It is absolutely necessary that the wheel should be a wet one, as no steel will stand being ground on an emery or carborundum wheel without water. The method of holding the drill should be as simple as possible, so as not to waste time in fastening or unfastening the drill. Sufficient backing must be given to the drill to let it cut properly. A boy is usually employed to keep all the drills sharp.

As regards tool-grinders, the opinion of American engineers is not so unanimous, but in the majority of shops a tool-grinder is found. In such shops a machine man is not usually allowed to grind his own tools, although in some shops he may do so. The advantages of a tool-grinder are self-evident and are many. The principal objections to their use are—firstly, it takes almost as long to grind a tool as it does by hand; secondly, if the machine man is at all expert in the use of his machine, he has his own way of working it, and likes to grind his tools to suit that way; and a man also wastes nearly as much time in going to the store for a new tool as he would take to sharpen the old one. On the whole, it is very much a question of the class of men employed, and the way they have been trained, as to whether a tool-grinder is advisable or not. It is, however, necessary to caution the English user of an American tool grinder that the cast irons of the two countries are two very different materials. The cutting angles of American tools are far too acute for English cast iron. This is a small matter, but may mean all the difference between failure and success. Grinding machines are used in all shops for circular work requiring an accurate finish, and are sometimes, but not generally, used for flat grinding. The allowance for grinding is from 0.004 in. to 0.006 in.

Gear wheels are, without exception, in the States cut from the solid blank. The gear cutters in common use are of the ordinary milling type. There is a form of slotting gear-cutter which gives very good results, but in its present form lacks stiffness. The cutting tool is a toothed cutter of the same pitch as the wheel to be cut, and is ground sharp on its bottom edge. It is attached to a circular slotting post, as in an ordinary slotting machine, which works up and down, while, at the same time, the wheel to be cut and the tool are slowly revolving. The first blank is cut by feeding the work in till the centers are the right distance apart—i. e., radius of pitch circle of wheel + that of cutter—when the circular traverse is then put on.

Bevel gear wheels, if small, are milled, but if large are shaped in the usual way. Small bevel wheels for accurate work are first milled, and are then put to work with a correct bevel wheels with roughened teeth, which scrape the teeth to shape.

Planing machines are run at much higher speeds than in this country, and, if of any size, have four tool-boxes. On the countershaft of many planers is a variable speed arrangement of the two-cone type.

Shapers are much the same as over here. As a rule, the head is fixed, and the work does the traversing.

A large amount of space might be devoted to turret and capstan lathes and all the modifications of them, such as screw machines and automatic screw machines; but much has already been written by writers more competent to deal with the subject. For repetition work they are undoubtedly a great success, but for a jobbing shop in this country the advantage gained is questionable. The great drawback to the ordinary turret-lathes is the expensive fittings required to work the machine at anything like its full capacity; but this difficulty is partly overcome in the case of the flat turret lathe. In many varieties of turret lathes the tool overhangs too much, whereby stiffness is sacrificed. Turret lathes in America usually do the class of work done in England by apprentices. A modification of the turret lathe is the forming machine, which has to a large extent done away with drop-forgings of a circular section. Articles which used to be drop-forged and then machined or polished, are now turned direct out of the solid bar with a forming tool. Bolts that are to have the shanks turned are turned out of solid hexagonal stock, and at the same time screwed in a screw machine.

The machine about which the greatest misapprehension exists in England is undoubtedly the milling machine. A miller is a capital machine on work for which it is intended, but when any sort of work is crowded on to a miller, it has not a fair chance. The man who buys a miller under the delusion that he is getting a machine which will do the work of a planer or shaper in a better manner and at less cost, finds out his mistake by experience. The only case the writer came across in the States in which a miller was used for roughing, and which it did in a satisfactory manner, was in two of the largest tool works, where lathe beds and such like articles were roughed out on a double-ended horizontal mill; but they were afterwards put on a planer, and a finishing cut taken to true them up for scraping. There is, however, much work in most shops which is done on planers which might be done to more advantage on a miller. The great drawback to millers with overhanging cutters is their lack of rigidity, and they consequently jar the work if the material being cut is at all hard. There were very few machines which the writer saw that did not suffer from this defect. Much more might be written about special machines and jigs, but the limit of this article is nearly reached.

In conclusion, the writer may say, as far as his experience in American machine tools goes, that England is ahead of America in the heavier classes of tools. When it comes to the lighter classes, America has taught England many wrinkles lately, which she has taken advantage of, as any one who visited the late Glasgow Exhibition might see. The chief fault of the American tools is their excessive lightness; and the writer is glad to see that, while England has copied some American notions, she has at the same time improved on them by giving them a more substantial form.

English steelmakers seem to have nearly a monopoly of the American tool steel market. The Americans themselves admit that their steel is not so durable. In some works charcoal is the only fuel allowed for working tool steel.

The writer has no desire to imitate Jeremiah, but he is of the opinion that in a few years America will suffer from worse labor troubles than the last engineering strike in this country. The men are nearly ripe for combination, and a large and general strike is only a question of time.

A German Naval Engineer on American Ship Building.

Tjard Schwartz, a German naval constructor, who was recently sent to the United States by the Marine General staff to investigate shipbuilding there, has submitted his report at Berlin. His descriptions are accompanied by photographs and drawings of new machines, especially of pneumatic contrivances used in shipbuilding. The German investigator refers to the splendid body of American workmen earning wages from 30 to 50 per cent higher than paid in Great Britain and 100 per cent higher than on the continent, and says wage bills in the United States are counterbalanced by economical processes of machinery, which are not found in European yards.

Herr Schwartz reports that notwithstanding the wages paid, freighters are being built on the Great Lakes as cheaply as tramp steamers are built in Great Britain. The investigator saw 75 pneumatic machines working at once in shipyards in Chicago, although only two ships were on the stocks. Herr Schwartz concerns himself in his report almost entirely with statements of fact, but in conclusion he expresses the opinion: "We see, therefore, that the Americans are striving with all the means at their command to put their shipbuilding industry in a position successfully to compete with the long-established English builders on the one hand and on the other with the younger but rapidly developing shipbuilders of Germany."

The Hilbert-Freiberg Machine Co., Cincinnati, has been changed by the sale of the interests of H. A. Freiberg to other members of the corporation. Mr. Freiberg held the majority of stock and since he went with the company about two years ago he has increased the sales and business very largely. The style of the company will not be changed until July 1, 1902, when the name Freiberg will be dropped. Mr. Freiberg will, it is understood, engage in some branch of the machine tool business.

AN IMPROVED GAS VALVE FOR HOT-BLAST STOVES.

It is the usual practice where the furnace gases are utilized in the heating of the furnace blast, to supply to the stove through a movable burner, the nozzle being combined with a cut-off valve so that when it is withdrawn the valve will be operated to shut off the supply of gases from the main. The inventor of the device under consideration, David Baker, now of Sydney, Cape Breton, was led to design this valve in order to obtain a compact arrangement combined with a dust-catcher, with the purpose of taking the gases from an overhead flue.

In the accompanying engravings, Fig. 1 is a plan of the device and a portion of a hot-blast stove, the latter being partly in section. Fig. 2 is a vertical section through the device on the

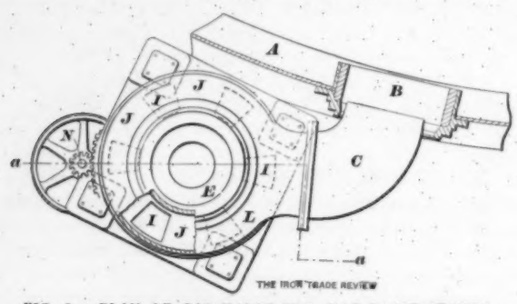


FIG 1.—PLAN OF GAS VALVE FOR HOT BLAST STOVES.

line *aa* of Fig. 1. A represents a hot-blast stove provided with an opening B, through which the furnace-gases are injected by a nozzle C from an overhead gas-main (indicated by dotted lines at D) and through a branch supply-pipe E, connected at its upper end with the main. The lower end of the branch pipe is seated on a flange F on the top of a casing G communicating therewith through a central opening in the flange, the chamber being sustained by standards H, rising from the ground. This flange is formed with a series of openings I and intervening closed portions J and has bolted to it a valve-seat K in the form of a ring-plate having openings corresponding in position and size with those in the flange. Surrounding the lower end of the supply-pipe and bearing on the valve seat is a rotary valve-chamber L, closed at its upper end and

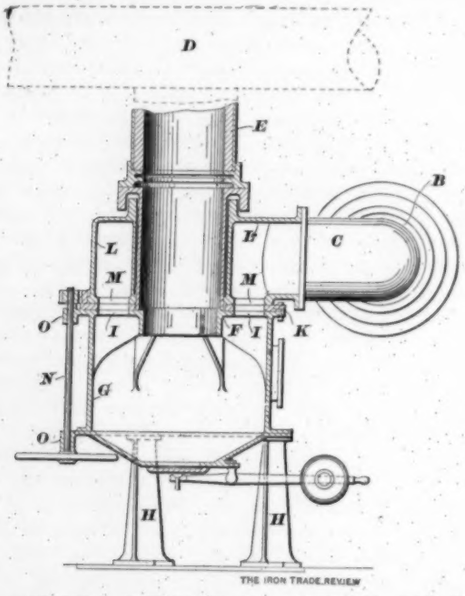


FIG. 2.—VERTICAL SECTION OF GAS VALVE FOR HOT BLAST STOVES.

formed at its lower end, where it bears on the valve-seat, with a series of openings M, corresponding in size and number with the openings through the valve seat. The nozzle C projects from the side of the annular chamber, and when the end of the nozzle is projected into the opening in the side of the stove, as shown in Fig. 1, the openings in the valve-seat and in the base of the chamber will be in register, permitting the gases to pass from the branch pipe through the valve-chamber and out through the nozzle into the stove. When, on the other hand, the nozzle is withdrawn from the stove by the rotation of the chamber, the valve openings will be closed and the supply of gas cut off. The rotation of the annular valve chamber to control in this way the flow of the gas to the stove is effected by a vertical shaft N, mounted in bearings O, on the side of the casing G; the shaft having a hand-wheel at the one end and a pinion at the other gearing into a rack.

The fixed chamber G beneath the end of the branch pipe serves as a receiver for the dust, the latter falling as the gas passes upward through the valve-openings. The accumulated dust may be removed from time to time through a circular door in the bottom of the chamber, held closed by a weighted lever, pivoted to the under side of the chamber.

For the purpose of preventing the direct passage of the gas from the branch supply-pipe to the valve chamber, in order to more effectually secure a separation of the dust, the inner edge of flange F has a vertical depending neck around which the gas is compelled to pass before entering the valve-chamber.

It will be seen that the gas is taken into the valve-chamber from above, the chamber being of annular form and surrounding the supply-pipe. It is also evident that the withdrawal of the nozzle is effected by a rotary motion of the valve chamber on an axis coincident with that of the supply-pipe, and as a result of a chamber of this form with the valve openings wholly surrounding it the gas enters the valve chamber uniformly at all points, so that a uniform flow of gas is insured.

In actual practice it is found that a large percentage of the flue dust which is so objectionable in the combustion chamber of the stove is caught in the dust collector of this valve and the entire construction is so compact that the arrangement may be placed between the stoves where the space is limited. Sixteen of these valves are in use at the South Works of the Illinois Steel Co., Chicago.

Articles of association of the Breitung Hematite Mining Co., Ltd., have been filed in Marquette. It is a Marquette corporation, capitalized at $1,000,000, divided into 40,000 shares of $25 each. The stock has been subscribed for as follows: Edward N. Breitung, $495,000; Charlotte G. Breitung, $5,000; Mary Kaufman, $450,000; Nathan M. Kaufman, $50,000. One-half of the capital is in cash, to be paid for in installments or otherwise, as the board of managers may direct, and for the remaining half there has been contributed the following described property: A leasehold interest in all that part of the southwest quarter of the southeast quarter, and of the southeast quarter of the southwest quarter, of section 6, lying south of Partridge brook in township 47, north of range 26 west, in the city of Negaunee. The two tracts which are owned jointly by the Breitung and Kaufman interests are valued at $500,000 and are leased for a term of 20 years. This is the land which was recently held in dispute between the Cleveland-Cliffs Iron Co. and the Breitung-Kaufman interests, the litigation involving the validity of the 99-year lease under which the company claimed to mine ore on the tracts as the successor of the old Pioneer Iron Co. This lease was held by the court to be invalid. The lands are reported to contain a valuable deposit of ore.

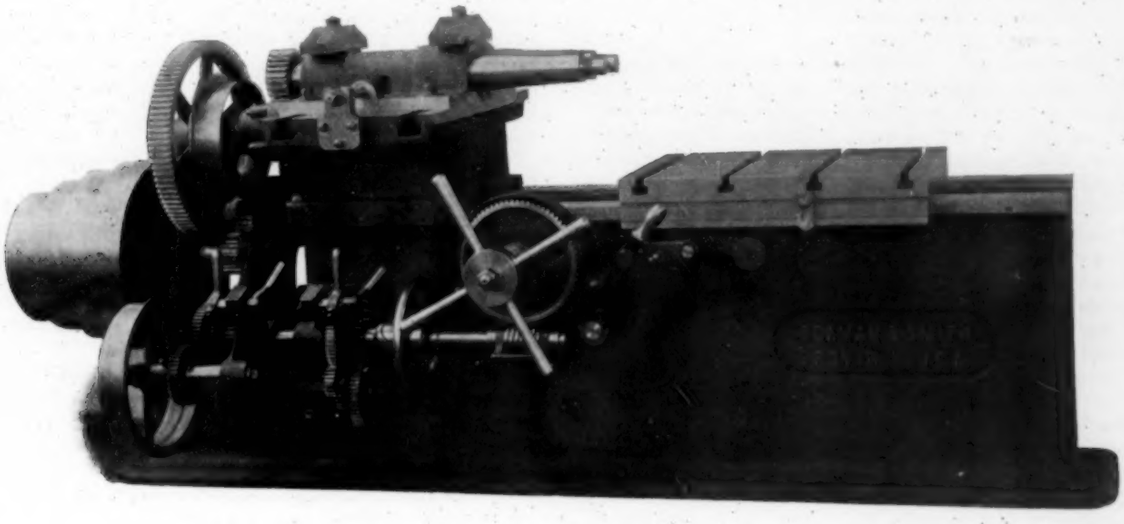
President Callaway of the American Locomotive Co. issued this statement this week: "We are looking forward to a year of growth and prosperity. It is our intention to spend at least $2,000,000 in improving our plants throughout. The production of the plant at Schenectady will be increased to 1,000, doubling it. These extensive additions will probably absorb the majority of the earnings of the year. Our present orders will keep us busy till well on the year, the total number of orders at present unfilled being 1,750. The American Locomotive Co. intends to adhere to the policy of extending its foreign trade. During the past year orders have come from South Africa, Mexico and Japan. This last order is especially gratifying, because we were the only American company tendered for the contract, which was let by the imperial government of Japan, and we competed successfully against the English and German companies.

The Economy Foundry Co., of Syracuse, N. Y., has increased its capital stock from $40,000 to $75,000.

AN ADJUSTABLE TWO-SPINDLE BORING MACHINE.

The illustration shows a new adjustable two-spindle boring machine of rugged construction. The machine has been designed for boring cylinders for automobiles, pumps and work of like nature, either boring two cylinders in one casting or boring one cylinder in each of two castings simultaneously. The bed of the machine is of the box type and extends under the gearing of the head to the bracket supporting the cone, holding the headstock, table and driving mechanism together in a rigid connection. The headstock is of box section and is designed to carry the solid spindle heads in such a manner as to absorb the vibration. The table is solid with the exception of the tee-slots which facilitate the fastening of suitable fixtures for holding the work. The machine is compact and self-contained and not liable to be thrown out of alignment by any change of the floor line. The spindles are steel running in hard bronze boxes, those at the inner end of the spindles being 4½ inches long while the outer boxes are 4 inches in length. The bearings nearest the cutters being tapered from 3 inches in diameter down to 2 9-16 inches, the rear bearings being cylindrical and 2½ inches in diameter.

The table for holding work is 28 inches long and 20 inches wide. There is a screw feed to the table having four rates of travel for each revolution of the spindle; that is, for an inch travel of the table the spindle will make 4, 8, 16 or 32 revolutions. It has an adjustable automatic stop to throw out the feed and is also provided with fine adjustment by means of the hand wheel shown in the illustration. There are two ratios of gearing from the driving cone to the spindle; one of 15 to 1 and another of 22 to 1.



ADJUSTABLE TWO-SPINDLE BORING MACHINE.

It will be noticed that the machine is capable of very convenient manipulation. The hand wheels and levers are within easy reach of the operator and the jam nuts on the feed gearing are of the lever type and there is no unnecessary delay in hunting for a wrench, a delay that is invariably costly because it occurs when the machine is idle. The machine is driven by a 3½ inch belt on a four step cone pulley of 14, 16, 18 and 20 inches in diameter. The center distance of the spindles may be varied from 4 to 8 inches and the center of the spindles above the table is 10 inches. The countershaft is to run at 300 r. p. m. and the approximate weight of the complete machine is 6,300 pounds. The machine has been recently constructed by the Beaman & Smith Co., of Providence, R. I.

H. T. Miller has been elected secretary of the Tallerday Steel Pipe & Tank Co., of Waterloo, Ia., to succeed C. B. Campbell, retired.

Arthur Hughes, who recently resigned as superintendent of the plant of the American Rolling Mill Co., Muskegon, Mich., has been appointed statistician of the Youngstown Iron, Sheet & Tube Co., Youngstown, O.

THE FOUNDRYMEN'S ASSOCIATION.

The 115th meeting of the Foundrymen's Association was held at the Manufacturers' Club, in Philadelphia, on Wednesday evening, Jan. 8, the president, Thos. I. Rankin, occupying the chair.

Secretary Howard Evans read a communication from the secretary of the McKinley National Memorial Association acknowledging the receipt of the donation of $50 ordered at the December meeting.

The deferred questions of the incorporation of the association under the laws of the state of Pennsylvania coming up for discussion. P. D. Wanner reported that he had looked into the matter fully and found that he could get a charter for $75. The matter was referred to the executive committee for a final report at the next meeting.

The secretary introduced Antonio C. Pessano, of the Geo. V. Cresson Co., who had been asked to speak on the work of the New York convention of the National Foundrymen's Association. Mr. Pessano said:

"The proceedings of the New York convention have been largely spread through the trade by the different trade journals and I think foundrymen generally are well acquainted with them. I might add, however, my personal views on the work of the convention. Before proceeding I would say in reference to the Chicago strike that the situation there is certainly a unique one. It has brought out the fact that the molders themselves are in battle array with the National officers of their organization. These National officers entered into an agreement with the National Founders' Association made in good faith as to the wage scale, and that agreement was thown overboard by the molders of Chicago. They threw it aside in defiance of the orders of their officers. That in itself may not appear much to the average mind, but to the deep-thinking foundryman it will carry great significance, for the reason that through the National Founders' Association the officers of the Iron Molders' Union had been brought to a state of mind that has to an extent given them a broader views of the situation as between employer and employe. They are willing today to look upon an agreement from a business standpoint and that has been brought about largely by conferences with the National Founders' Association officers and its committees.

"In regard to the officers of the Iron Molders' Union I want to say to their credit that today I do not believe you can find among the trade unions a more able set of men, nor a more honest set, or men who recognize an agreement and believe when they make it it should be kept regardless of whether it altogether suits their constituencies or not. If they believe it is to their best interests to make an agreement they make it and believe it should be stuck to. Some years ago such a state of things would not have been thought of. It was then simply a question of tossing a shovel into the

air and going out. Today the conditions are changed, and simply because agreements can be made and kept.

"In Chicago it was believed the agreement would be kept, but the men did not themselves keep it. But that did not change the intentions or purposes of the officers and they have stood along that line ever since the agreement was made and they stand there today, with the result that the local union of Chicago is entirely disrupted. They have no organization whatever, and the man who led that strike is today, I understand, out for a job. He has lost his prestige simply because he went contrary to the rulings of the National officers of his union. Looking at it from the molders' side, it is a pretty rough condition of affairs. When the National officers of a trade union are willing to stand up and disregard one of the strongest of their organizations, the object must be a serious one. The men have disobeyed their National officers and have in consequence been ignored, with the result that founders are running practically open shops employing apprentices, laborers and others under conditions to suit themselves and without restrictions. The finances of the National Founders' Association have not had a very large drain on account of the strike.

"The condition of affairs in Chicago may be duplicated in any other city at any time, but when it is we know we have behind us a powerful organization and that to our aid come all the mainstays of the foundry trade throughout the country; and with it all we know there is justice behind every step taken. The association wants to see justice on both sides, and it is this desire which gives us prestige. The president and vice-president of the Iron Molders' Union I know from personal experience are willing today to enter into any agreement which is fair and just and they will not tolerate for a moment anything the men want which they think has a tinge of injustice. That is simply because they are face to face with a body of men whom they have learned to respect because they know they can get justice; and as it is accorded to them they want to give back even more. This state of affairs comes through organization, and for that reason alone we cannot measure its value in dollars and cents.

"Another point brought out at the convention was this, that when the machinists' strike, which lasted many months in the West, was at its height, the iron molders in quite a number of foundries in this city were urging the National officers of the Iron Molders' Union to allow them to go out on a sympathetic strike that the machinists might gain their ends. One of our members telephoned me in reference to the matter, saying that he understood his molders were going out on the following Monday with the idea of starting a movement to tie the foundries up. I took the matter up at once with the representative of the Iron Molders' Union here, and while it was late on Saturday afternoon he said he would do his best to keep the men in the foundries. He did so, and on Monday morning they were all working. This result was reached after the exertion of influence far deeper and wider reaching than we can imagine. It was simply due to the influence of an agreement made with the National officers of their organization. This is only one instance where founders have been benefited by the new order of things. Later it was divulged that the officers of the Iron Molders' Union had received a large number of telegrams from molders' Unions in different sections requesting permission to strike in sympathy with the machinists. The request in every case was refused. If the strike had been allowed at least 8,000 molders would have been involved. You can take your pencil and figure out the loss on, say, a four-months' strike under these circumstances to both employers and employed. This loss was saved to the country by the National Founders' Association, saved because they had an agreement with the Iron Molders' Union which was respected.

"Notwithstanding this good feeling between the two associations the National officers of the Iron Molders' Union have been obliged to bow to the inevitable at Chicago, as far as their efforts were concerned, but no support was given to the strikers, and the condition of the strike is in consequence as I have described it. Though the men in Chicago have broken their agreement with us, I want you to remember how many agreements have been honorably kept. While both organizations regret the state of affairs in Chicago we have a good deal to congratulate ourselves upon. These are a few of the points, or rather, lessons, that came to me and were brought out in this convention. Today we have before us as foundrymen the necessity for making our organization better known, and increasing its strength, as the stronger our membership the stronger our agreements and the greater the likelihood of their being kept."

President Rankin: I think there are very few men employing labor who appreciate the large amount of work performed by the executive committee of the National Founders' Association. It has been a mystery to me for months how Mr. Pessano, Mr. Pfahler and others have accomplished all they have and attended to their own business as well. When we come to think of the number of paid officers employed on the molders' side we have an inkling of the amount of work to be done on our own.

Mr. Devlin: I happen to know a little something of Mr. Pessano's work, and I know, too, that owing to his extreme modesty he has not told you one twentieth part of the labor he has performed for the benefit of the founders here in Philadelphia. I know personally that we should have had at least half a dozen strikes had it not been for the arrangement he made with the Iron Molders' Union's representatives in this district. Every foundryman should join our organization, as we shall then be better able to secure justice for both foundrymen and workmen. I hope every foundryman in Philadelphia will join the association and lend encouragement to the work. I have attended some of the meetings and know something about the executive committee's work. I know that the members of that committee have at times left their businesses and spent as much as ten days for the good of the foundrymen of this country. We can never repay them for the good they are doing.

The Stearns Molding Machine.

A paper on "The Stearns Molding Machine and Snap Flask" was read by W. M. Potter of E. C. Stearns & Co., of Syracuse, N. Y. A molding machine was shown in practical operation before the meeting and patterns and castings exhibited. The paper was in substance as follows:

"The molding machine which I have here which I wish to demonstrate to you and to which I invite your inspection and attention, is of the class termed by some 'squeezers' for the reason that it does nothing but press the sand and take the place of the hand rammer. Other types of molding machines have their place and usages, such as stripper plate type and others where the pattern is drawn by mechanical means. These machines, however, are mainly adapted to the production of pieces that are alike as to cope and nowel, but they are not well adapted to the various places where snap flask or bench work is done in general foundry practice.

"In order to put in use the Stearns molding machine nothing different in the way of flasks, patterns or follow boards is required, the only change being necessary is that the bottom boards should be made a loose fit, say ¼ inch in length and width smaller than the inside of the flask. This machine is only intended for the use of manufacturers producing work in snap flasks on the bench, and it will not help a jobbing foundry where only a few castings at a time are made.

"It has been the aim in the design of this machine to reduce the number of parts to the minimum, and also to so increase the leverage that the least exertion is required to operate it. Aside from the reduction in the cost of molding the most noticeable feature in the use of the molding machine is the uniformity it produces in the castings. In the case of many castings that are made in our foundry, such as lawn mower wheels, where the wheels have an internal gear, the molding machine added materially to the uniformity of this work; and in other instances where small pieces of hardware are required to assemble without machine work the molding machine has produced a uniformity in the work that was not even appreciated by ourselves.

"I have here a casting of a card of hinge patterns that we make in large quantities. I have taken this just as it left the sand and before it enters the tumbling mills. On this card of patterns, which is 8 in. by 20 in., a molder puts up 100 molds per day. Most of this small hardware work is made not by molders, but by apprentices or young men who have not worked long at the business. We believe it is a conservative estimate to say that from 25 per cent to 33 1-3 per cent more

work can be accomplished with the use of machines than without them. Of course this is for such pieces as the machines are adapted to. Yet there are many pieces that are made on the bench that we would not recommend a machine to do, as they can be done better by hand. This machine is so designed that the platen when thrown back forms a regular bench that a molder can work on by hand and not use the machine portion of the ramming mechanism.

"I also have here bronze patterns from the master patterns, so smooth that little or no work has been required in making the card of patterns. Formerly it cost from $30 to $50 to make a card of fine brass patterns such as these hinges. These are now by careful molding made smooth enough to require but little work in making the patterns. You may appreciate how little there is done on patterns when I show you these. When they break off from the gate, as we all know they do constantly where patterns are in frequent or continuous use, we simply mold these over and solder on new pieces rather than to take the trouble to let in sheet metal gates."

After the reading of the paper and some informal talk upon the matter presented the meeting adjourned.

THE NEW YORK MACHINERY MARKET.

NEW YORK, Jan. 14.—The general tone of business continues excellent, and the commonly accepted slackening of trade at the beginning of the new year has so far failed to materialize. Now that the "dead line" has been passed there is a total lack of even sentimental fears, and many of the manufacturers and agents report the renewal of inquiries that had almost been forgotten. Many of these culminate in business, particularly if the goods can be delivered in a reasonable time. The lavish expenditure upon shop improvements, extension of plants and additions to equipment means a profitable business and a belief that the prosperity of the country is destined for long continuance and the manufacturer must put his house in order if he intends to make the most of it.

M. H. Treadwell & Co., owners of the Myerstown foundry, have leased the extensive plant of the Lebanon Mfg. Co., Lebanon, Pa. M. H. Treadwell is treasurer, with offices at 95-97 Liberty St., this city, and his company has hitherto been engaged as engineers, founders and machinists, contracting for special machinery and iron work of various kinds. For some years the company has operated at Myerstown and the acquisition of the Lebanon works will greatly enlarge its scope of business. Improved machinery is to be installed and the several departments equipped with modern facilities. It is expected that after present plans have matured an extension of the work will be undertaken and the output include other products than cars, castings, etc.

Milliken Bros., of this city, have secured the contract for the erection of the plant of the American McKenna Process Co., at Warners, N. J., where old rails will be re-rolled for the export trade. The company at present operates plants at Kansas City and Joliet, Ill., which confine their attention to domestic trade. Each of these plants turn out about 100 tons of re-rolled rails daily. The New Jersey works will have a much larger capacity than the existing plants of the company, being capable of re-rolling 200,000 tons of old rails annually. The Lewis Foundry & Machine Co., of Pittsburg, have the contract for the equipment of the plant. The boilers are to be of the water tube type, manufactured by Hyde Bros. & Co., of Pittsburg, and the engines will be built by the Harrisburg Foundry & Machine Works, of Harrisburg, Pa. The new plant is expected to be in operation by May 1. The McKenna people are considering the advisability of erecting another plant in Canada.

A cable dispatch from London says that at a meeting of forty business men located in the British metropolis Saturday it was decided to support the exclusively American exhibition which is to be held at the London Crystal Palace from May to November of this year. It was resolved also to send memorials to the governors of the various states in the United States asking for their co-operation. Sub-committees were appointed on various matters in connection with the exposition. Alfred H. Post, of the foreign freight contracting firm of Alfred H. Post & Co., produce exchange, who is the commissioner for the United States, is quoted to the effect that applications for the placing of exhibits had already been received for nearly 75 per cent of the available space. Among the exhibitors appear the names of the Niles-Bement-Pond Co., Niles Tool Works Co., General Electric Co., Babcock & Wilcox Co., Fairbanks Co., Wellman-Seaver Engineering Co., National Cash Register Co., the Remington and other typewriter companies, American Waltham Watch Co., etc.

The Halfmoon Power Transmitter Co. has filed articles of incorporation in the Saratoga county clerk's office. The capital stock is $500,000, and the company will manufacture all kinds of electric power transmitting machinery at Mechanicsville. Thomas Greenwood, Patrick Egan and Michael J. Egan are the incorporators and first directors.

Japan will probably undertake the construction of works for the manufacture of steel and iron plate at Kure, the building of army barracks at Formosa at a cost of $1,150,000 and the extension of the government railroads to the docks at Kobe and Yokohama, which it is estimated will entail an expenditure of some $2,000,000. It is expected that American manufacturers will have a chance to furnish equipment.

The Warsaw-Wilkenson Co., of Warsaw, N. Y., has been incorporated with a capital of $100,000 and will expend about $25,000 on a plant for the manufacture of agricultural implements. There will be two steel frame buildings, 50x264 feet, and a foundry. W. C. Gouinlock is president of the company.

The Dow Composing Machine Co., of Phœnicia, Ulster county, has been incorporated at Albany with a capital of $3,000,000, to manufacture type and type setting machines. The directors are Julian Florian, Sidney R. Perry, Andrew D. Robertson, William Seton Gordon, J. Noah H. Slee, Frank C. Garmany, John A. Eckert and Wm. G. Peet, of New York city; A. T. Latson, W. W. Wilson, J. I. Bergen and V. H. Emerson, of Brooklyn.

The United States Light & Heating Co., capital $3,000,000, has filed a certificate of incorporation at Trenton, N. J. The company is to furnish electricity, light and heat, especially for railways and electric cars. The incorporators are Wm. B. Irwin, Wallace Young, John J. Gilbert, all of Jersey City.

The following corporations have been recently organized and will have offices at 419 Market St., Camden, N. J. The Marine Boiler Works Co., capital $100,000. Incorporators: C. A. Leeper, Richard Reeves and C. B. Floyd. The Hunt Foundry & Machine Co., capital, $100,000. Incorporators: H. E. Hunt, Geo. H. Clapp and M. J. Dair.

President Coffin, of the General Electric Co., is expected to leave for Europe this week. The main purpose being the extension of the business of the British Thomson-Houston Co., a subsidiary corporation controlled by the General Electric Co., and some changes and additions will probably be undertaken at the Rugby plant in England.

At a special meeting of the stockholders of the Westinghouse Machine Co., held at the offices of the company at East Pittsburg, on Tuesday, Jan. 7, the capital stock was increased from $3,000,000 to $5,000,000. The increase was made to meet the rapidly growing demands for the products of the company. It was announced previous to the meeting that George Westinghouse had relinquished the preferred rights of the stock for the benefit of the company. The net earnings of the company for the past two years has been at the rate of 20 per cent on the outstanding stock.

The National Bridge Co. recently organized under the laws of New Jersey is preparing to build a large bridge plant on a site of 47 acres upon, which an option has been secured at Monaca, Pa. Bids for grading the property are already being received and the bulidings of the new plant will cover about 14 acres. An office of the company has already been opened in the Fitzsimmons building, Pittsburg, and E. M. Schofield, formerly manager of the Youngstown, O., plant of the American Bridge Co., is in charge.

James McNeil & Bro. Co., Pittsburg, Pa., boiler manufacturers, have commenced suit against the Crucible Steel Co. of America for $75,000 damages as the result of a boiler explosion at the Park plant of the company in the Lawrenceville district, Pittsburg. The plaintiff company demands $50,000 damages for the destruction of its plant, $5,000 for the total loss of the plant and $20,000 for the increased cost in filling present contracts.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Eby Machinery Co., of San Francisco, Cal., has been incorporated with $96,000 capital to deal in machinery and mill supplies. J. D. Eby, T. M. Galvin, A. D. Eby F. H. Ledvedge and J. E. Stott are the incorporators.

The Ideal Brass Foundry has been formed at Saginaw, Mich., by Andrew Murray and Frank J. Maruna. A specialty will be made of brass, bronze and aluminum castings.

The Jones Automatic Stoker Co., of Chicago, has been incorporated with $50,000 capital to manufacture furnaces and stokers. J. P. Grier, W. H. Tuttle and N. C. Cross are the incorporators.

The Atkins, Young & Allen Co., with $10,000 capital has been organized at Benton Harbor, Mich., to manufacture pumps and other machinery.

The Juniata Steel & Iron Co. has been incorporated at Greencastle, Ind., with a capital of $250,000 for the purpose of erecting and operating a tin plate plant. The incorporators are F. M. Strong, Samuel Lewis, W. H. Richards, J. H. Seiherling and H. M. Strong.

The Kimball Machinery Co., of Huron, S. D., has been incorporated with $50,000 capital to deal in all kinds of machinery and supplies. G. W. Laster, H. A. Kimball, E. Laster, N. M. Lawrence and Philip Lawrence are the incorporators.

At Louisville, Ky., Messrs. Davis, Kelley & Co., are promoting the organization of the Louisville Steel & Iron Co., to be capitalized at $500,000. The promoters intend to erect a large open-hearth plant and to not only manufacture billets for the general market, but sheet bars also for consumption in their own sheet mill.

S. B. Patch & Sons, Streator, Ill., will shortly increase the capacity of their foundry by adding two cupolas and a traveling crane.

Heywood Bros. & Dobbins, Jennings, La., is reported to be in the market for a gang or multiple drill for drilling well castings, and a pipe threading machine.

The Piedmont Foundry & Machine Co., Hickory, N. C., has been incorporated with a capital of $10,000.

The Des Moines Automobile Co., Des Moines, Ia., recently incorporated with a capital of $50,000, will erect a two-story brick building 44x132.

The National Iron Works, St. Louis, Mo., has been incorporated with a capital of $10,000. John F. Hines, William G. Kaysing and John Greely are the incorporators.

A. L. Henderer's Sons, Wilmington, Del., are in the market for a 40 to 50 h. p. engine and boiler, and will consider second hand equipment if in good condition.

The McKeefrey Coal Co., of Pittsburg, has been incorporated with $100,000 capital to operate coal mines in the Pittsburg coal district. As yet the location of the properties acquired or to be acquired has not been made known. N. J. and W. D. McKeefrey, of the firm of McKeefrey & Co., of Leetonia, O., J. C. Biley, R. T. Russell, S. W. Langdon and C. B. Motheral are the incorporators.

The Kingsley Patent Boiler Co. of New York, has been incorporated with $1,250,000 capital to manufacture a patent boiler and machinery. James Lord, James Virdin and J. L. Wolcott are the incorporators.

The Standard Bale Wire Buckle Co., of Weatherford, Tex., has been incorporated with $25,000 capital. The company will manufacture wire buckles for baling cotton. R. H. Felton, G. P. Levy and W. H. Edelman are the incorporators.

The Steel Corner Plate Co., of Chicago, Ill., has been incorporated with $10,000 capital by T. S. Fauntleroy, W. A. Rowland and W. R. Starwurth.

The Wolf Company, of Chambersburg, Pa., will be incorporated shortly for the purpose of operating a plant to manufacture rolling mill machinery and mill supplies. H. G. Wolf, J. J. Pollard and J. A. Strite are the incorporators.

The United States Truss Co., of Chicago, Ill., has been incorporated with $5,000 capital to manufacture steel trusses for building purposes. E. E. Rhorabaugh, C. P. Clifford and C. A. Klotz are the incorporators.

The Western Brass Manufacturing Co., of Chicago, Ill., has been incorporated with capital stock of $5,000 by J. Hadka, Casper Schweitzer and C. B. Baulicek.

The National Iron Works, of St. Louis, have been incorporated with $10,000 capital. J. F. Hines, W. G. Koysing and Carl Ott are the incorporators.

The Coronet Steel Co., of New York, has been incorporated at Albany with $2,500,000 capital, for the purpose of developing a new process of making basic steel. The directors are H. R. Payne, C. H. Blair, E. C. Blair of New York; O. H. P. Cornell, of Brooklyn, and John S. Cooke, of Paterson, N. J. Mr. Cooke was at one time identified with the works of the American Locomotive Co. at Paterson, N. J.

The United States Screw-Nail & Machine Co. of Reading, Pa., was incorporated in New Jersey last week with $100,000 capital. The company will erect a plant for the construction of machines to make the so-called "screw nail" and will also manufacture the nails. S. E. Groff, of Reading, is the inventor of the nail and machine.

The Sharon Chemical Co., a subsidiary company of the Sharon Steel Co., Sharon, Pa., has been incorporated with a capital of $200,000 to operate a chemical plant at Sharon. William Flinn J. B. Howat, F. F. Marquard chief chemists, W. H. Lewis, general superintendent, and A. McCrea are named as directors.

G. T. Glascock & Sons, Greensboro, N. C., are reported as desiring prices on a universal milling machine, 16-inch shaper, key-seater and bolt machine.

J. F. Denihan, 450 Hamilton avenue, Brooklyn, N. Y., is said to be in the market for a 30-inch lathe, short bed (dealers' prices).

Fires and Accidents:—

The Peter Lippere foundry at Kenosha, Wis., was destroyed by fire last week, entailing a loss of $11,000.

Fire damaged the Berger Brothers' tin plate and corrugating plant at Philadelphia, Pa., to the extent of $10,000 last week.

New Construction:—

The Atlas Engine Works, Indianapolis, Ind., will build a cupola house at Columbia avenue and the Belt Railroad tracks to cost $6,000.

The Union Foundry Works, Grand Crossing, Ill., will build a one-story brick addition.

Extensive improvements are being made to the plant of the South Bend Chilled Plow Co., South Bend, Ind. These include a new engine room, 30x40, a 700-h. p. engine, a complete exhaust system and electric light system, two additional annealing ovens, making a total of six ten-ton ovens in the malleable iron department, a steel casting plant, including a Schwartz furnace of eight tons capacity, and a telephone equipment connecting every department in the factory. Besides the foregoing, the company has built a two-story addition to the machine shop, 50x300, and an addition to the malleable iron foundry, 40x125.

The St. Joseph Plow Co., St. Joseph, Mo. has increased its capital stock to $125,000. This move is said to be preliminary to an enlargement of the plant.

The Wilmot & Hobbs Mfg. Co., of Bridgeport, Conn., is planning to build an open-hearth plant, blooming mill, and other equipment for the rolling of 14x14-inch ingots. The output will be about 300 tons a day and the steel will be used in the manufacture of tubes.

The Monmouth Plow Co., Monmouth, Ill., recently incorporated, with a capital stock of $100,000 will build a plant comprising, main building, 80x300, three stories; a blacksmith shop, 80x300, one story; an assembly room, 80x100, one story, and an engine room, 40x60. The following officers have been elected: John S. Brown, president; James French, vice-president; W. T. M. Brunnemer, general manager; T. H. Spicer, secretary and treasurer.

The Dillon-Griswold Wire Co., Sterling, Ill., is building a new dipping room 40x80 feet.

The Hicks Locomotive Works, Chicago Heights, Ill., will erect a new building 200x250 feet to be devoted to the manufacture of high class railway cars.

The Standard Iron Works, San Diego, Cal., will erect a new building 100 feet long and 60 feet wide. A new office

building and warehouse two stories high and 40x90 feet will also be erected.

The Steel Car Forge Co., of Elwood City, Pa., will erect a 30-foot extension to their machine shop.

The American Foundry Co., Indianapolis, Ind., recently incorporated with a capital of $16,000, will erect a foundry with a capacity of 15 tons of gray iron per day. W. H. Orcutt is treasurer of the company.

The Pittsburg District:—

The McKeesport Mfg. Co., of McKeesport, Pa., recently incorporated for the purpose of operating a tin plate plant at Port Vue, a borough opposite McKeesport, has employed Samuel Diescher, of Pittsburg, as consulting engineer and superintendent of construction. The hot and cold rolling mills will be located in a building 75x400 feet. The annealing furnace and gas generator building will be 25x200 feet; pickling department, 25x400 feet; furnace building, 25x300 feet; tinning house, with a capacity of 24 stacks, will occupy a building 75x600 feet. In this building will also be located the sorting room and stockhouse. At present the plans call for a ten-mill plant with a monthly capacity of about 35,000 boxes. The stockholders of the company are E. P. Douglass, J. C. Smith, Dr. J. W. Fawcett, Dr. E. T. Nason, G. F. Meyer, R. T. Carothers, E. R. Crawford, J. E. Lauck and E. W. Pitts, of McKeesport, and William Curry, of Pittsburg. Mr. Lauck will be superintendent and Mr. Crawford general manager. Both recently resigned from the McKeesport plant of the American Tin Plate Co.

Henry Phipps, of Pittsburg, purchased the Alexander Speer Plow Works property on Duquesne Way last week for $350,000.

The employes of the Homestead plant of the Carnegie Steel Works last week contributed $10,000 to the McKinley memorial fund.

The James Rees & Sons Co., Pittsburg, has purchased additional property on Duquesne Way, adjoining their present plant for the erection of a modern boiler plant. A portion of the property on which the plant is now located has been secured for the erection of an immense warehouse on the Point.

The Champion Rivet Co., of Cleveland, O., has purchased nine acres of land at Parnassus, Pa., near Pittsburg, upon which an immense rivet manufacturing plant will be located. This will not affect the operation of the Cleveland plant, however.

The stockholders of the Lloyd Mfg. Co., of Pittsburg, recently incorporated with a capital stock of $1,000, increased their capitalization to $75,000 this week. The company will erect a plant in this district for the manufacture of a patented coal digging machine. The directors of the company are C. H. Lloyd, J. C. Donehoo, J. F. Richards, C. E. Wolfendale and Stephen Neuburn. Mr. Lloyd is president and Mr. Donehoo is secretary and treasurer.

At a meeting of the stockholders of the James H. Baker Mfg. Co. held last week it was decided to increase the capital stock $150,000. This is to provide for the big additions now being made to the company's plant at Tarentum, Pa.

Emil Swensson, formerly manager of the Keystone plant of the American Bridge Works, has located an office at 600 Lewis building as civil and consulting engineer. Mr. Swensson was with the Keystone plant for 14 years, and is known throughout the country as a structural engineer of unusual ability.

In the month of December the following Pittsburg concerns increased their capital stock: Pittsburg Seamless Tube Co., $1,000 to $500,000; American Railway Tie & Girder Co., $1,000 to $25,000; Eagle Foundry & Machine Co., $10,000 to $50,000; Shenango Furnace Co., $120,000 to $600,000.

General Industrial Notes:—

The American Bridge Co. of the United States Steel Corporation has taken out incorporation papers in the state of Michigan in order to operate a recently acquired plant in that state. The laws of Michigan require such action.

The stack of the Struthers Furnace Co., Struthers, O., was blown in last week, after being out for nearly two months owing to the coke famine. The coke supply is reported much better throughout the entire Mahoning Valley.

There has been no reduction in the wages of the men employed in the Anderson, Ind., plant of the American Steel & Wire Co., despite reports to the contrary. The rumor of a cut became circulated owing to a change made in the hours of different "turns."

Officials both of the United States Steel Corporation and the Pressed Steel Car Co. deny that the Fox plant of the Pressed Steel Car Co., at Joliet, Ill., has been purchased by the United States Steel Corporation. No changes are anticipated in the management of the Fox plant and operations will shortly be resumed on a much larger scale than ever before.

The Bessemer Gas Engine Co.'s foundry at Grove City, Pa., has been leased by a new company recently organized of which Benjamin Spearman of Sharpsville, Pa., is president; A. Seaton, Mercer, vice-president; W. H. Christie, Mercer, secretary, and J. M. Albin, treasurer and manager. The foundry will operate on gray iron and brass castings.

At a meeting of the stockholders of the recently incorporated Youngstown Steel Casting Co., held at Youngstown, O., last week, directors were elected as follows: T. B. Van Alstine, E. B. Lawrence, David Rosser, George Higley, J. W. Rogers, J. R. Long, Arthur Eynon, Harry Parrock and George E. Rose. The directors organized by electing E. B. Lawrence president; T. B. Van Alstine, vice-president, and J. W. Rogers, secretary and treasurer. The company has already secured a site for its plant and the erection of a large steel casting plant will proceed at once. W. R. Palmer, of Cleveland, formerly connected with the Cleveland Rolling Mill Co., and more recently with the Tennessee Coal & Iron Railroad Co., at Ensley, Ala., has been elected general manager.

At a meeting of the stockholders of the Champion Iron Co., of Kenton, O., held last week, directors were elected as follows: G. J. Carter, Lloyd Carter, J. L. Simpson, E. W. Wynes and G. W. Simpson. Officers were elected as follows: G. J. Carter, president and treasurer; J. L. Simpson, secretary, and E. W. Wynes was appointed superintendent.

It is reported that the Sylvan Steel Works of the Republic Iron & Steel Co., at Moline, Ill., will be dismantled and the machinery removed to the Springfield, Ill., plant, which will again be placed in operation shortly.

The stockholders of the recently incorporated Morrison Air Safety Valve Co., of Toledo, O., elected officers and directors as follows: O. P. Bowman, president; Eli A. Stark, vice-president; Dr. W. H. Bowman, secretary; T. F. Whittlesey, treasurer; F. B. Morrison, manager. Board of directors, A. W. Lefler, F. B. Morrison, T. F. Whittlesey, O. P. Bowman, Eli A. Stark

P. & F. Corbin, of New Britain, Conn., manufacturers of builders' hardware, have contracts under way for a seven-story addition to be completed in the spring. An article in a local paper recently, detailing the upbuilding of this industry, relates that in 1849 when Edward Doen, Philip Corbin and Frank Corbin formed a partnership their combined capital was $900. After buying equipment they had left as working capital $68. Their first products were brass ox balls, lamp hooks and lifting handles. The establishment today is probably the largest manufactory of its kind in the world, the products including door locks, builders' hardware, ornamental bronze door and house trimmings, iron and brass, wood and machine screws, etc. Its present officers are: Philip Corbin, its founder and developer, president and treasurer; Andrew Corbin, vice-president; C. M. Jarvis, second vice-president; Charles Wetmore, secretary.

The capital stock of the Spaulding-Jennings Steel Co., of West Bergen, N. J., has been reduced from $400,000 to $4,000, and the company will shortly be entirely dissolved. The action is merely formal, as the plant was absorbed by the Crucible Steel Co. of America more than a year ago.

The annual meeting of the stockholders of the Sharon Steel Co., Sharon, Pa., will be held on Tuesday, Jan. 28, at Sharon, Pa. At this meeting Frank H. Buhl, formerly president of the company, will probably resign from the board of directors.

It is altogether probable that two bridges now spanning the Ohio river and owned by the Baltimore & Ohio Railroad Co., will shortly be rebuilt. The bridges connect Benwood, W. Va., and Bellaire, O., and Belpre, O., and Parkersburg, W.

Va. Both are alleged to interfere with navigation and the United States Government has been asked to pay a fair share of the rebuilding cost. No less than 15,000 tons of structural material would be required in their reconstruction.

The puddling department of the Youngstown Iron Sheet & Tube Co., Youngstown, O., will not be placed in operation for several weeks; and it is possible that the plant will not be placed in operation before Feb. 1. The commencement of operations at this plant not only means much for the Youngstown district, but for the iron and steel trade generally as the company is independent and is erecting one of the largest single plants outside of the United States Steel Corporation.

The machinery of the steel rail plant of the Tennessee Coal, Iron & Railroad Co., Ensley, Ala., is now being tested and the first rails will be rolled shortly.

The Lancaster Malleable Iron Works, Lancaster, N. Y., last week recorded a deed of trust at Buffalo covering its plant and real estate to secure an issue of bonds not to exceed $100,000, of which $50,000 has already been issued. The controlling interest in this company has recently been acquired by McKeefrey & Co., Leetonia, O.; C. D. Rood, Springfield, Mass.; Hon. J. S. Lambert and F. R. Green, of Fredonia, N. Y.,; H. H. Hewitt and E. C. Randall, of Buffalo, N. Y. The foundry will be immediately enlarged and the daily capacity increased from 18 to 75 tons. This will necessitate the addition of a large amount of foundry equipment. The output will be limited to malleable entirely.

An application for the appointment of a receiver for the Blue Mountain Iron & Steel Co., of Baltimore, has been made by the D. W. R. Read Co., of Philadelphia. The petitioners allege that the defendant company is indebted to them for a large sum of money for coke furnished for use in operating the Catoctin furnace near Baltimore.

The King Machine Co., of Moline, Ill., has made an assignment to Fred R. Pollard who has been placed in charge of the plant.

The Central Iron & Coal Co., of Tuscaloosa, Ala., has purchased ore lands and other properties owned by the Martin Mining Co., and the Woodstock Ore Co. The deal embraces the purchase of 820 acres of ore land and includes ore washers and other machinery for the proper manipulation of the ores mined. The mines have a daily output of about 4,000 tons. The company also purchased the old Edwards furnace at Woodstock, Ala., which has been idle for nearly ten years. It is probable that a second furnace will be built which will have a much greater capacity than the Edwards stack. It is also the intention of the new company to erect a large foundry.

The Springfield, Ill., plant of the Republic Iron & Steel Co. will be placed in operation again as soon as the machinery can be repaired and cleaned. Many improvements are also under consideration and additions will probably be made that will greatly increase the output of the plant.

The first steel made at the plant of the Dominion Iron & Steel Co., Sydney, N. S., was cast the last day of 1901. The product was open-hearth steel and was made from 60 per cent pig iron and 40 per cent scrap.

The Craig Foundry Co., of Toledo, O., has recently secured a contract from the Westinghouse Electric & Mfg. Co., of Pittsburg, for 1,800 tons of castings, deliveries to be made within six months at the rate of 300 tons per month.

The International Steam Pump Co. has acquired 31 acres of land in Harrison, N. J., and will erect in the near future an immense pump manufacturing plant on the site. The plant will be made up of at least seven buildings according to the plans already outlined.

The Hollidaysburg Iron & Nail Co., Hollidaysburg, Pa., will erect an addition 100x200 feet. This will practically double the size of the plant.

The Berlin Machine Co., Beloit, Wis., is having a machine shop erected 200x200 feet. A large amount of general machine shop equipment will be required for this big addition.

Contracts were let last week for the reconstruction of the plant of the Crawfordsville Wire & Nail Co., Crawfordsville, Ind., which was recently destroyed by fire. The wire mill will be 270 feet long and 102 feet wide, while the machine shop and barbed wire nail mill will be 270 feet long and 50 feet wide.

The Gadsden Pipe Works, Gadsden, Ala., will erect a new plant 125x200 feet.

Calvin, Pardee & Co., Lattimer Mines, Pa., will shortly install a modern foundry in connection with their machine and blacksmith shops.

David S. Creswell, of Philadelphia, proprietor of the Eagle Iron Foundry at Nicetown, Pa., is having plans drawn for an additional foundry building, 53x191 feet.

The E. G. Brooke Iron Co., Reading, Pa., will erect a steel foundry 248 feet long and 229 feet wide. The machine shop will be 60x140 feet. Both buildings will be commanded by electric cranes.

The American Bridge Co. will build an addition to its Pittsburg plant at a cost of several hundred thousand dollars. James A. Huston, general manager of the company, says that the contracts made with the Wabash Railroad are such that it is impossible for the bridge company to make the necessary supplies in its own plants or to get them elsewhere. As the bridge work of the company is rapidly developing larger structures, the company decided to build a permanent plant which will give it facilities to take care of all future contracts. The directors of the company will decide some time this month the exact location of the new plant.—[Railroad Gazette.

The S. P. Wetherill Co., of Philadelphia, has increased its capital stock from $50,000 to $100,000.

The Wyoming Cutlery Co., of Wilkesbarre, Pa., has increased its capital stock from $50,000 to $75,000.

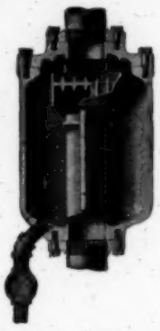
The large addition to the plant of the Franklin Steel Casting Co., Franklin, Pa., is fast nearing completion. The addition is 210 feet long and 106 feet wide and the output of the foundry will be materially increased by its construction.

The Niles, O., furnace of the National Steel Co., was blown in last week after having been out of blast several weeks on account of the shortage of coke.

The Baush Machine Tool Co., of Springfield, Mass., will shortly increase its capital stock from $75,000 to $150,000 to provide for a greater working capital for the company's increased business. Several large orders were recently received, on calling for 36 radial drills for the Pennsylvania Steel Co., Steelton, Pa., while the McClintic-Marshall Construction Co., of Pittsburg, placed an order for 28 radial drills.

The Ironsides Co., of Columbus, O., has just completed extensive improvements in its factory equipment whereby its facilities are increased 100 per cent. The manufactures of this company cover materials for use in operating departments for preservation and protection of wire ropes, gearing, belting, fiber ropes and metallic surfaces generally.

The American Stove Co., of Chicago, incorporated under the laws of New Jersey with a capital of $5,000,000, was launched last week. Nine companies manufacturing gasoline and oil stoves, gas stoves and appliances were absorbed. They are as follows: Ringen Stove Co., St. Louis; Quick Meal Stove Co., St. Louis; George M. Clark & Co., Chicago; Schneider & Trenkamp Co., Cleveland; the Standard Lighting Co., Cleveland; the Dangler Stove & Mfg. Co., Cleveland; the National Vapor Stove Mfg. Co., Lorain, O.; the Monarch Stove & Mfg. Co., Mansfield, O., and the Twin Burner Vapor Stove Co., St. Louis. The new company will have offices in St. Louis, Chicago and Cleveland. The officers elected are: President, C. A. Stockstrom, St. Louis, Mo.; vice-presidents, George M. Clark, Chicago; D. A. Dangler, Cleveland; F. L. Alcott, Cleveland; secretary, H. J. Trenkamp, Cleveland; treasurer, George F. Fisk. F. L. Alcott was elected as general manager of the five plants in the Cleveland district, and O. P. Moon as assistant manager at the other plants, which are located, one at Harvey, Ill., and two at St. Louis. The Harvey plant will be managed by George M. Clark, and the St. Louis plants by Louis Stockstrom. There are 17 directors. The new company starts out with a bonded indebtedness of $750,000, bearing 5 per cent interest, and with a working capital of upward of $1,200,000. The earnings for 1901 of the plants acquired were sufficient in amount to meet all fixed charges, pay a 6 per cent dividend upon the entire capital stock of the new company and leave a surplus of $50,000 for the retirement of bonds.



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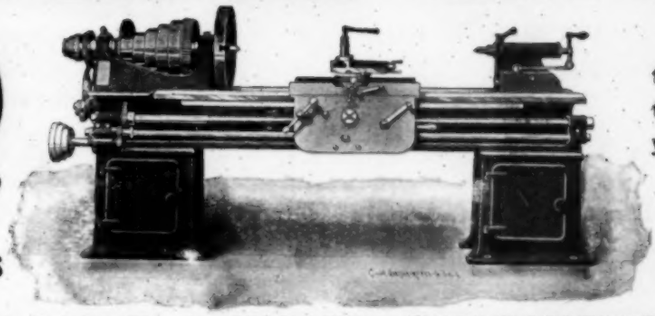

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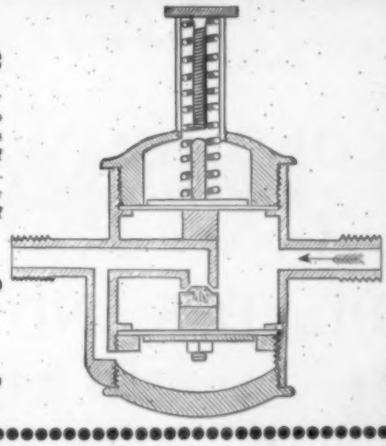

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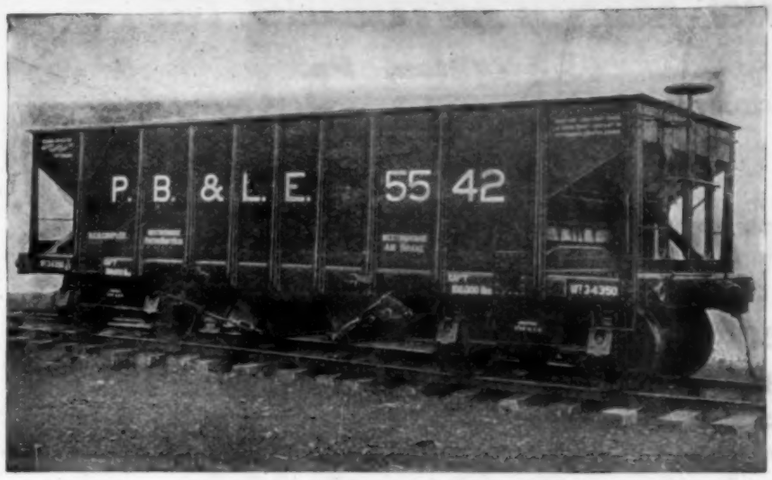

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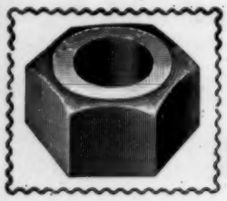

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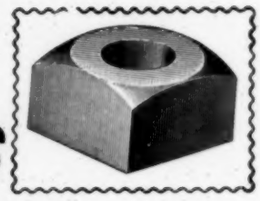

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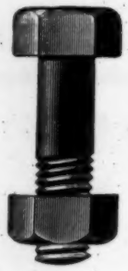

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Locations For Industries.

The name of the Chicago, Milwaukee & St. Paul Railway has long been identified with practical measures for the general upbuilding of its territory and the promotion of its commerce, hence manufacturers have an assurance that they will find themselves at home on the company's lines.

The Chicago, Milwaukee & St. Paul Railway Company's 6,300 miles of railway, exclusive of second track, connecting track or sidings, traverses eight states, namely:

NORTH DAKOTA	MINNESOTA	NORTHERN MICHIGAN
SOUTH DAKOTA	IOWA	WISCONSIN
Express Passenger Trains Fast Freight Trains Throughout.	MISSOURI	ILLINOIS

which comprise a great Agricultural, Manufacturing and Mining territory.

The Chicago, Milwaukee & St. Paul Railway Company gives unremitting attention to the development of local traffic on its lines and, with this in view, seeks to increase the number of manufacturing plants on its system either through their creation by local enterprise or the influx of manufacturers from the East. It has all its territory districted in relation to resources, adaptability and advantages for manufacturing. Specific information furnished manufacturers in regard to suitable locations. Address,

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Old Colony Building, Chicago, Ill.

Don't Wait Until Your Boiler Lets Go.

Prevent disaster by using the

Wright Improved Safety Water Column

A high water alarm, a low water alarm, and both combined. A safety device that never fails. Has proved its worth for years.

The catalog will convince you that its use guarantees economy in fuel and boiler repairs, aside from insuring safety to life and property. Write for it.

And don't forget the **WRIGHT EMERGENCY STEAM TRAP** (we make it) when the Trap is wanted that will dispose of most water quickest.

WRIGHT MANUFACTURING CO.

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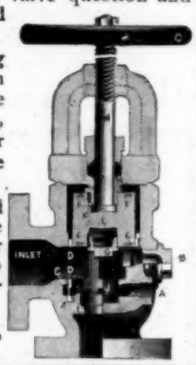
The Lunkenheimer "Duro" Blow-off Valve

With Self-cleansing Seat,

Is built upon lines radically different from any other. Although it is new, its practicability has been established by exhaustive tests. It solves the blow-off valve question and supplies the demand for a durable and reliable valve of this kind.



The steam jet, blowing over the seating surfaces before contact, cleanses them from scale, sediment, etc. With the scale and sediment kept off seating surfaces, there is nothing present to cut and wear out the valve. Will outlast a dozen of the ordinary kinds of angle blow-off valves.

When worn, any part can be replaced without trouble—built on the interchangeable plan. The entire design is massively substantial and admits of use under the heaviest pressures and severest conditions. Warranted to Satisfy. Specify the "Duro" if you want complete satisfaction. Write for catalog.

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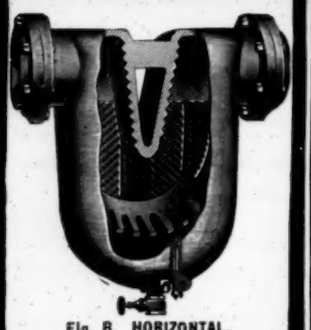

Fig. B. HORIZONTAL.

Steam Separators

ANY SEPARATOR

is better than no separator at all. But why not get the best?

AUSTIN STEAM SEPARATORS,

with their 99 per cent efficiency, are a most absolute prevention against water in the cylinder, with the consequent liability to expensive accidents from pounding, etc. It works equally well, too, for eliminating oil and other impurities from exhaust.

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